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Dorothy Tristan
by Milton H. Greene

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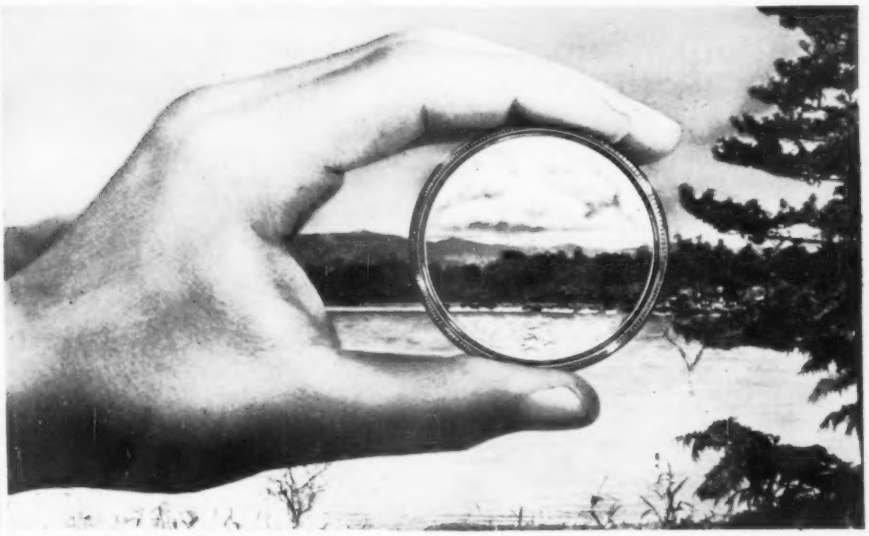

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JULY, 1958 VOLUME 43, NO. 1

WORLD'S LEADING PHOTOGRAPHIC MAGAZINE

Palm Beach, Fla., provided the background for this gay, informal photograph of Dorothy Tristam. Milton H. Greene, on assignment for *Look* magazine, used Ektachrome in his Rolleiflex. His 80-mm f/2.8 Schneider Xenotar lens was set at f/8, which brought into focus the horizontal and vertical designs of the buildings, heightening the dramatic effect of the standing figure and the boardwalk that seems to stretch infinitely. Shutter speed was 1/50.

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LETTERS TO THE EDITOR

Piggy-back cameras

Here's a picture for your "I Wuz Gonna" department. About 2 years ago I rigged up a piggy-back arrangement to use my Leica and reflex housing with

Still-warm idea

a 4x5 view camera. The whole thing worked out so well I was going to write about it for publication. Now I see Don Ornitz has beat me to it (April, pages 68-69). Next time I'll get those ideas to you before they get cold.

JAMES E. TANNEHILL
Fort Wayne, Ind.

R.I.T. symposium—two views

In reference to the article, *Three Controversial Pictures*, in your March issue, I think that the idea of a picture analysis by a group was excellent and that the realization was poor. In his stimulating article Mr. Hattersley promised much. In the discussion he delivered little. The best remarks were made by your own reporter, an observer—a sad comment about the group. The students showed a remarkable command of professional jargon, but chewed only on the surface. The essence of each picture was missed. Ernst Haas' picture puzzled the symposium, but nobody thought of bringing up what Haas has explained so many times: that his main interest lies in making the abstract look real and the real look abstract. Charbonnier's picture is a tour de force: he managed to give a reportage photograph the force of a symbol. The symposium felt it and expressed it: *Nature is big but humans are small.* The message of the picture is, however, not this incredible platitude but: *Nature is menacing, but humans are playing* (as true for the Island of Seins as it is for our entire atomic age). In the case of my portrait of Freuchen which, by the way, was one variation of my jacket of Freuchen's *Book of the Seven Seas*, the discussion did not center around the prime purpose of a portrait—whether the essence of a human being was captured or not—but it turned around Mr. Freuchen's pores! I suppose that each of the three photographers whose pictures were discussed felt like the designer who exhibited a new car with a powerful engine and saw the "experts" discussing solely the texture of the upholstery. Photography is the only art form without adequate critique. If one wants an intelligent discussion—and photography needs it—one must not invite

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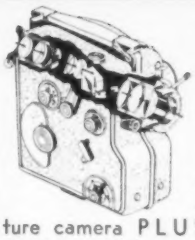

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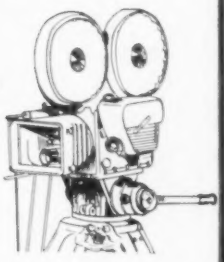

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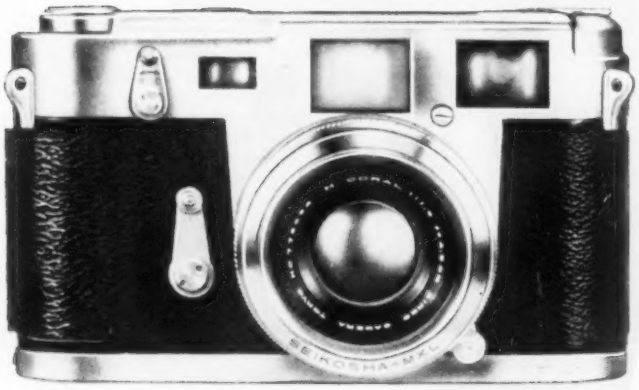

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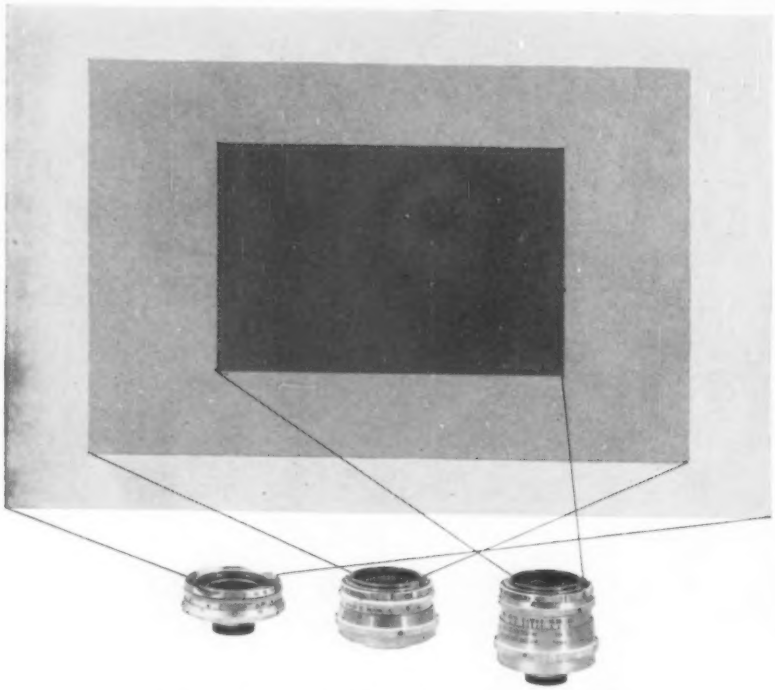

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sophomores but intelligent and articulate experts, i.e.: Brodovitch, Smith, Mili, Elisofon—I could name dozens of them. With kindest regards to you and your colleagues and with the hope that you don't mind my frankness.

PHILIPPE HALSMAN
New York, N. Y.

I must first tell you how proud I am that you chose one of my photographs to be discussed by the students of the Rochester Institute of Technology, especially when in the company of such photographers as Ernst Haas and Philippe Halsman . . . Once a "good" picture is completed, sooner or later the reader will dig out the intentions, techniques, feelings, etc., which in combination created within the photographer the *will* to take precisely *that* picture. Inside the photographer happened an instantaneous superimpression of wishes, visions, sensations, memories, technical skill, actor-like feelings for a given sensation—a complex I might call "photographic obviousness." The work of the reader will be to analyze this super-fast synthesis. Digging deeply enough, readers might also find intentions the photographer never had, or had only subconsciously. That is why it is interesting to watch people you don't know analyzing a work one has done. I must say that no one amongst the R.I.T. students really went further away than my intentions when I took that picture on the Island of Seins, which means that they think hard before talking.

JEAN-PHILIPPE CHARBONNIER
Paris, France

Thirteen and eight

While reading *Rangefinder* in the April issue, a friend dropped by and we put the magazine down to check out a new strobe and slave unit. Before we had a chance to click the shutter, our little

Beware of dog!

dachshund jumped up in the subject's lap and immediately qualified for "lens louse" of the month. Our impulse was to quote "thirteen and eight" but we took the picture anyhow.

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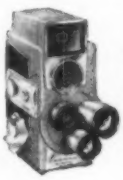

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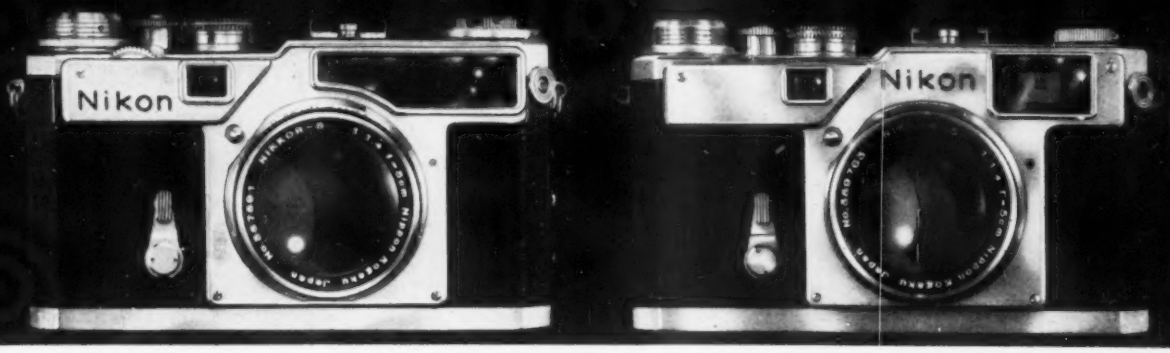

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35-mm TODAY

by Bob Schwalberg

Five years ago, at a now famous convention of the Society of German Photographers (GDL), a Hamburg professional named Willi Beutler openly attacked one of photography's oldest sacred cows: *fine-grain development.* In so doing Beutler challenged a number of related misconceptions and made it stick, with an exhibit of outstandingly superior large-scale prints made from 35-mm negatives. Beutler's case rested upon two major points:

First, that grain and sharpness are not automatically mutually antagonistic, and that a finer grained image is not necessarily sharper than a grainier image, all other things remaining equal.

Second, that so-called fine-grain developers can not yield maximum emulsion sharpness because they depend to some extent upon the inclusion of substances which dissolve away a portion of the image-forming metallic silver produced by the developer. Moreover, such developers require that the film be given somewhat longer exposures which encourages the deleterious effects of light-scatter *(irradiation and halation)* within the film emulsion.

Not content merely to attack, he offered a number of suggestions which have become widely known as "the Beutler system." This system, which has been a very major factor in the recent resurrection of 35-mm quality standards, is based upon the use of extremely-fine-grain thin-emulsion films (Beutler used Adox KB-14) with a special kind of developer having three important characteristics. These are (1) a relatively high concentration of alkaline salts such as sodium carbonate or sodium hydroxide, (2) a very low concentration of developing agents such as metol, etc., obtained by means of a high dilution ratio, and (3) the total absence of any silver solvents or restrainers such as sodium or potassium thiocyanate or potassium bromide. To understand exactly why such a developer is able to yield the ultimate image quality obtainable from thin-emulsion films we must first understand certain basic principles:

Thin-emulsion films tend to blacken in development much more rapidly than other film types. And, it's interesting to note that the over-all density may actually be heavier than that deposited by a soft-working high-speed film given equal exposure and development. With such excessively dense thin-film negatives, however, the photographer would be unable to obtain prints in which both the highlights *and* the shadows appeared with adequate detail and contrast. In order to do justice to both ends of the tonal scale a developer for thin-emulsion films must be very efficient within the shadow areas and inefficient in the highlights.

The trouble is that all developers are relatively more efficient in their ability to produce highlight rather than shadow densities. Thus, with a typical M. Q. developer, for example, if we extend the immersion time so as to increase shadow density by a very small amount we will simultaneously obtain a considerably greater increase in highlight detail. There are, however, two general methods whereby developers can be made to behave somewhat more fairly, producing adequate shadow densities without excessively dense highlight deposits.

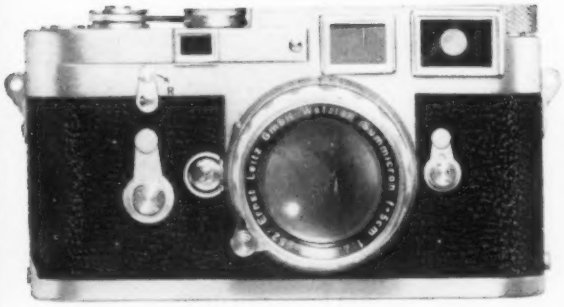
The first of these methods, and the one which has found the widest applications during the past twenty years, involves the formulation of an essentially soft-working formula by means of the selection of developing agents chosen for low contrast (and frequently low energy) characteristics, and the inclusion of chemical restrainers which limit the rate at which developer energy is expended. While such developers almost always fulfill the requirement of producing a printable balance between highlight and shadow densities they are nevertheless almost always unacceptable for thin-emulsion films because they undermine true image sharpness. This is because they either dissolve some of the silver deposited during development (or fail to completely develop all of the exposed silver) and produce a mottling of the grain pattern. An unsharp, or mottled grain pattern reduces the contour sharpness (contrast at the edges of image contours) which has come to be termed acutance, and widely recognized as a primary concomitant of image sharpness.

Thin-emulsion film (Adox KB-17) and compensating developer (FR X-22) produced minimum grain plus maximum sharpness in this back-lighted summer scene by Arthur Goldsmith.

Moreover, if we think of contrast in terms of both over-all, or gross contrast *(which is the arithmetic ratio between maximum and minimum silver deposits within the negative as a whole)* and gradation *(which is the local contrast existing between similar deposits within the highlight, middle-tone, and shadow areas of the negative)* it will be recognized that many popular soft-working fine-grain developers tend to produce decidedly inferior gradation. This is particularly true of gradation within the heaviest and the lightest density groupings. And, all other things remaining equal, lower gradation means inferior sharpness.

The other method of designing a de-

continued on page 26



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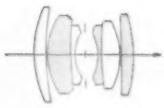

The old-fashioned picture-diagonal-method of determining a camera's lens would put a 165 mm lens on a 4 x 5 camera —and continues to put a 50 mm lens on a 35 mm camera. Yet invariably today's professionals prefer the 135 mm lens on the 4 x 5 and the 35 mm lens on the 35 mm camera.

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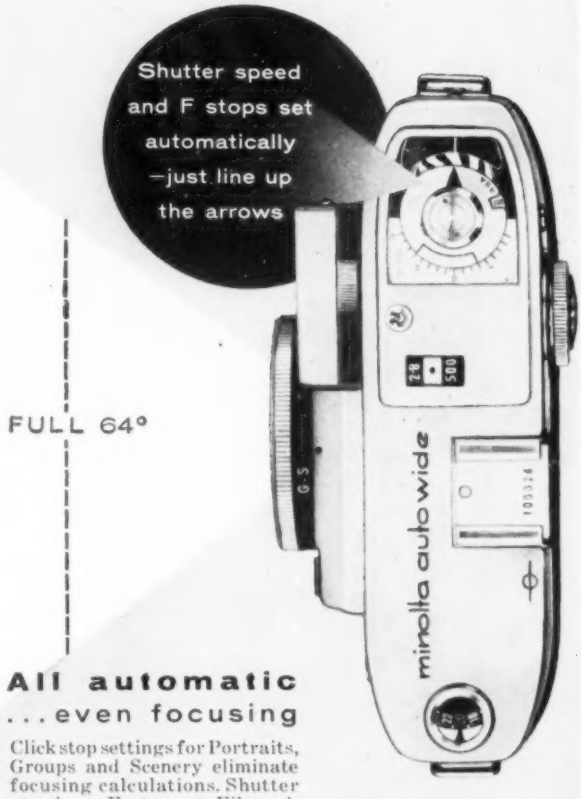

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by David B. Eisendrath, Jr.

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Shooting north-front buildings

I want to make a color photograph of a small factory that faces north, and have found that at no time of the year does the sun ever strike the front of the building. How can I get a good color shot?—N.B., St. Paul, Minn.

This is a problem that makes life miserable for professional photographers, especially architectural specialists! When I am confronted with this kind of problem I try several things. Sometimes in the summer the sun is high enough overhead so as not to be shining directly into the camera, or perhaps the direct sun can be hidden by a tree branch or foliage. In these cases a Skylight filter or a warming filter like an 81A may overcome the objectionable blue shadow. If the sun is high enough, a Polaroid filter is also helpful in darkening the sky behind the building. Occasionally I have been lucky enough to have bushes and hedges in the foreground in which I could hide blue flashbulbs.

When I have been stumped and the above suggestions are not practical, I then try to make a night picture, which is often quite dramatic and effective, especially if the interior lights are turned on for a short while during the exposure. Frankly, north-front buildings can be real problems to photograph.

Off-color from bounce flash

I have been having problems with bounce flash. Although I get excellent results with black-and-white film, I have not had the same luck with color film. The shadow under the chin of my subject is too dark, and the color is not good. The color I get with electronic flash, directed at the subject, is very good, however. Why is my bouncelight giving me trouble?—R.K.J., Winnetka, Ill.

Your trouble seems to be twofold. Your transparencies are too warm and yellowish. I suspect that your ceiling, or whatever you are bouncing your light from, is not a good bright white; the ceiling may be dirty or the paint on it may have been warmed with a little umber or sienna when it was mixed. Try using a roll of white background paper, or a lightweight panel covered with aluminum foil and see if that does not help.

I would suspect a yellow cast, perhaps, from the walls, except that the sample pictures you sent showed that your walls are dark. This probably precludes the possibility of your bad color coming from the walls, but gives the answer to your other problem of bad illumination. The light from your electronic flash is hitting the ceiling and is being reflected almost *entirely* by this—which gives almost the same effect as if you were lighting by a single flood light held high up over the subject's head. Your walls are offering no help at all as far as reflectance is concerned. I suggest that you also try some reflective surfaces lower than the ceiling (white paper or foil) to bounce some of the light back up into the shadows. Another suggestion is to move your flash farther back so that it bounces from the ceiling farther in front of the subject and not so much from directly over his head.

Color cast in lenses

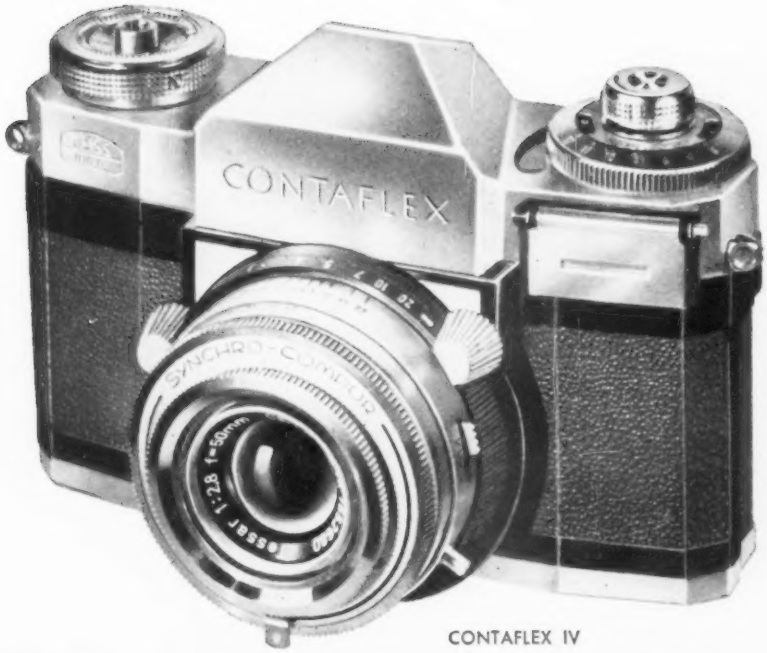
A friend has a Voigtlander Nokton lens for his Leica and claims it is especially good for color because it gives a "neutral color rendition." What does this mean?—B.R.K., St. Louis, Mo.

I have mentioned before that certain lenses have a slight color cast to them. In fact if you look through them against a white surface you will see that some lenses are slightly yellowish or bluish. This may be caused by the coatings or the combinations of optical glass used in their construction. In fact, some of the high refractive index glasses made from the rare earth glasses sometimes tend to be a little yellowish. As a rule the coloring is so slight that it has no noticeable effect on color films, since it is usually less than a 10 CC filter would be, and the color latitude of film, processing, etc., is within that tolerance. The only place this might make a difference would be if in making movies, you switched from a bluish lens to a yellowish one, and if the coloring of the lenses were strong enough, this might give a peculiar effect.

I have suggested that if you were troubled with this to always use a light filter on the offending lens so that all your movie lenses give the same rendition. Most high-quality modern-day lenses do not give enough "cast" to be noticed. Certain of the modern lenses have been particularly corrected for this, and the Nokton has a reputation of giving neutral or uncontaminated color.

NOTE: Several readers have sent me clippings from the catalog of a large mail-order house which offered "an 85C filter which permits the use of indoor color film and clear flashbulbs for both indoor and outdoor pictures . . . with Kodachrome Type F film." Maybe the mail-order people have made a discovery, but this ad is misleading. With Kodachrome Type F film you can make pictures with clear flashbulbs indoors (or at night out of doors) without a filter. With the Wratten 85C filter you can use Kodachrome Type F film outdoors with daylight using an ASA index of 10. If you need flash fill outdoors when you are using this filter, you will have to use blue flashbulbs. Incidentally, Type F Kodachrome can also be used with photofloods with an 82A filter.

Questions of general interest to the color photographer will be answered in this department. However, individual replies can not be given for questions that are not used.—Ed.



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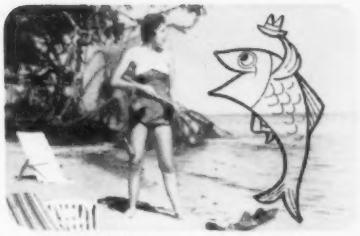
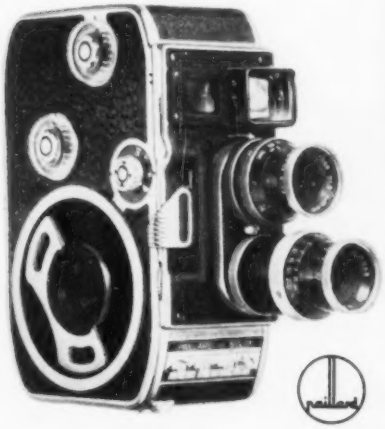


Animation
with single frame settings



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NEW BOOKS

PHOTOGRAPHY AND THE LAW by George Chernoff and Hershel B. Sarbin. Published by Amphoto, New York. 127 pages, illustrated, $1.95 paper bound, $3.50 cloth bound.

LEGAL ASPECTS OF PHOTOGRAPHY by Robert Veit Sherwin. Published by Greenberg, New York, 126 pages, illustrated, $1.95 paper bound.

It is perhaps unfortunate that two different books dealing with the same subject should appear almost at the same time. Yet the publication of two volumes about the law and photography is welcome, for the field has not been adequately covered in the light of current jurisprudence. It is particularly necessary to compare *Photography and the Law* and *Legal Aspects of Photography* simultaneously since they approach the same subject so differently.

Legal Aspects of Photography is filled with catchy titles and pithy phrases, but such headings as "The Photographer's Enemy," "The Illegal Advertiser," "The Deal-Stealer," "The Cheating Publisher," and many others are generally enough to scare the wits out of any photographer and make him feel that enemies lurk behind every lamp-post. One would feel, from the Sherwin tenor, that as a rule no photographer has any friends in the advertising and publishing fields.

Although Sherwin touches upon a variety of topics, the superficiality of information given leaves the reader with little idea as to what the *law* actually is other than the author's statement or interpretation of it. He rarely gives documentation or reference, and case after case is discussed without his citing or identifying them by name, making reference to which court decided them, or telling where citation of statutes may be found. Except in rare instances he does not even indicate to which states the statutes apply.

Many of the subjects discussed might apply to any private citizen, and not especially to photographic activity. Such cases as "The Hotel Trap," involving a camera stolen from a hotel room, apply just as aptly to the theft of a mink coat or a pearl necklace. Although many subjects are covered, some important ones are barely touched, and some aspects are completely omitted. For example, Sherwin discusses the subject of "Loss of Film" in much the same way as he might advise a client who had an original-design dress ruined by a dry cleaner, yet makes no mention of loss of film by a carrier, an important subject on which much legal consideration, judgment, and interest exist.

Both Chernoff and Sarbin have had considerable experience in handling the legal problems of photographers. Perhaps that is one reason why the tone of their book, *Photography and the Law*, is almost the opposite of Sherwin's book. They feel that photographers are entitled to protection and have the same rights as any private citizen or professional worker. Not only do they explain these rights in a highly readable and useful volume, but they state, chapter and verse, the main aspects of photographic law. Well-documented citations of cases and excerpts from court opinions leave no doubt as to what the judge actually said. The authors have added further comments and explanations of their own, and not only are the cases named, but also the law reports in which they can be found are given. This gives the book added value as a ready reference for an attorney or legal adviser beyond its service to photographers in general.

Photography and the Law represents a positive approach to the subject and an affirmative point of view. It clearly points out to the photographer just what he may and may not do, without giving the impression that everyone is trying to take advantage of him, and that from the beginning, the courts, laws, and juries are all opposing him.

Many examples are given, backed up with logical explanations and concise statements as to what the law really is. It's not surprising then, that the two books contain opposing viewpoints or conflicting statements on the same subject or laws. For example, Sherwin says that where releases are concerned, the mere gift of permission to use a subject's photograph is not valid and that a consenting model must receive some compensation for the release. Chernoff and Sarbin, on the other hand, show that under all Rights of Privacy statutes, as well as in Common Law statutes, all that is required is the subject's consent (which must be in writing in some cases).

Another example: Sherwin comments that licensing of photographers has been declared illegal as an attempt by some photographers to keep others from practicing their trade. Chernoff and Sarbin point out that the basis on which licensing statutes were invalidated was that such statutes are an unconstitutional encroachment upon the liberty of a citizen to choose and pursue an innocent occupation, it being beyond the police power of the state to regulate the practice of a trade which is harmless and without detriment to public welfare. They then go on to list the licensing requirements of each state.

In other cases the explanations given by Sherwin are incomplete and liable to misinterpretation. His advice on the desirability of a photographer's obtaining copyright prior to publication is a case in point. This is a subject in which Chernoff and Sarbin offer some notably simple, practical, and non-frightening advice.

If you are an amateur photographer who likes to make an occasional dollar on the side, if you use photography as part or all of your livelihood, or if you are even likely to sell, publish, or exhibit a photograph, *Photography and the Law* contains much concise, sound, and valuable help.—*David B. Eisendrath, Jr.*

NEW BOOKS continued on page 26

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New Books

continued from page 22

THE MOVIES, by Richard Griffith and Arthur Mayer. Published by Simon and Schuster, 630 Fifth Ave., New York, N. Y. Cloth-bound, 9x 12¼, illustrated. 442 pages. $15.

This huge book is described on the book jacket as "The sixty-year story of the world of Hollywood and its effect on America, from the pre-nickelodeon days to the present, told in 1000 wonderful pictures and 150,000 words of brilliant text." Many of the 1000 pictures are wonderful and if the 150,000 words of text are somewhat less than brilliant, at least they are lively and informative. Any volume as large as this is bound to contain a few mistakes in history; this book is no exception. While it contains a lot of information, its primary purpose is obviously for entertainment. As such it is a remarkable success. Reading it and looking at its pictures is even more fun than going to the movies.—*C. R. R.*

35-mm Today

continued from page 14

veloper capable of properly developing the shadows without overdeveloping the highlights makes use of a few straightforward principles of photography. The most important of these is the principle that developer solution at work in the highlights tends to exhaust itself at a relatively faster rate than developer solution working in the shadows. This applies to all developers, even the most contrasty, and the rate of exhaustion in the highlights can be increased by simple dilution with water. But, if the developer is extremely dilute it will be unable to produce adequate shadow detail and contrast. To avoid this, developers for thin-emulsion films are given enhanced alkalinity in order fully to develop shadow detail. With this type of formula (which is frequently referred to as a *compensating* developer) an inherently contrasty thin-emulsion film can produce equal shadow density with less highlight density than a medium- or high-speed material exposed under the same subject and lighting conditions and developed in a standard fine-grain developer.

The final requirement for a thin-emulsion film developer is, as we've already indicated, the absence of any silver-solvent action. Whether or not some degree of solvent activity is or is not helpful in the development of the faster films, such solvents are neither necessary nor desirable in the processing of thin-emulsion films. First of all, with the unbelievably fine-grain patterns inherent in our modern thin-films, this action is completely unnecessary. But, more than this, solvent action means the dissolving away of image-forming silver and, therefore, a serious loss of image sharpness.

Next month we'll conclude this discussion of the Beutler system in terms of exposure and development technique.—

MINOX B
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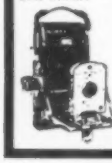

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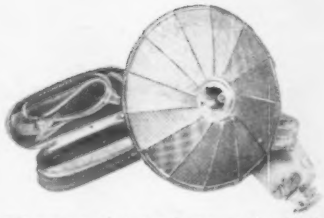

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WHAT'S NEW

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AGFA AUTOMATIC 66

A report on the world's only automatic-exposure still camera

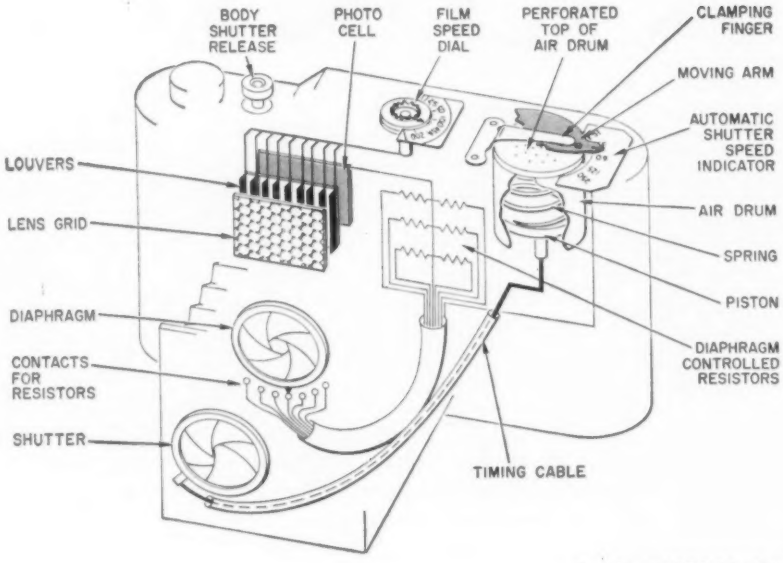
THE long-awaited Agfa Automatic 66 —a roll-film camera which automatically sets its own exposure—is at last available in this country. When first introduced at Photokina in Cologne, two years ago, it drew the interested attention of the entire photographic world. An automatic-exposure still camera must be able to handle a variety of shutter speeds, *f*-stops, and film ratings (unlike the electric-eye movie cameras which have appeared since and which contend with only one fixed shutter speed and two film speed settings). The diagram and captions below, based on POPULAR PHOTOGRAPHY's examination of the 66's inner workings, explain in detail exactly how the camera overcomes these problems with an ingenious combination of mechanical, pneumatic, and electrical control systems.

On the outside, the 66 looks deceptively like just another in Agfa's long line of roll-film cameras. But what it does is quite another matter. A photoelectric cell continuously monitors subject brightness, takes into account the film's exposure

In addition to the conventional shutter speed settings, the Agfa Automatic 66 has a unique electric-eye controlled exposure system (detailed below) that sets shutter speed automatically.

HOW THE AGFA 66 SETS ITS OWN EXPOSURE

Reflected light from subject falls on **photo cell** (shown in gray), generating tiny electrical current which turns **moving arm** (also gray, upper right) in same manner as any meter's photo cell turns meter pointer. This arm is the core of the 66's system. As it turns, it **(1)** tells shutter speed on **automatic shutter speed indicator,** and **(2)** uncovers a series of perforations in top of **air drum.** These holes govern speed at which air can enter drum. This, in turn, governs speed at which spring-loaded **piston** can drop. Piston is linked by **timing cable** to **shutter,** thus controlling its speed from 1/15 to 1/250 second. Pressing **body shutter release** also lowers **clamping finger** which holds moving arm airtight against drum as pneumatic timing sequence is activated. To compensate for filmspeed used, setting **film speed dial** adjusts **louvers** in front of photo cell, admitting more or less light as required. An electrical system compensates for changes in lens openings. **Contacts** at each *f*-stop switch **resistors** into photo-cell circuit, thus regulating the current flowing to the moving arm. Complicated, but it works.



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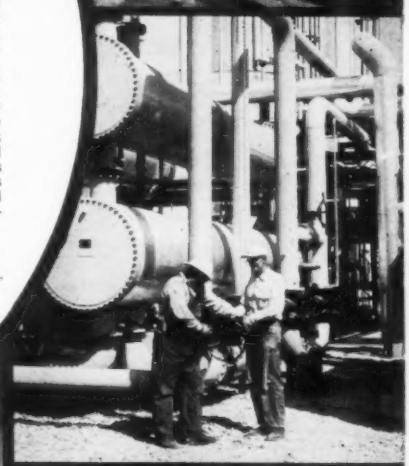

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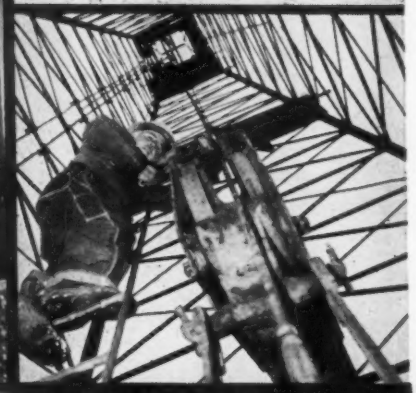

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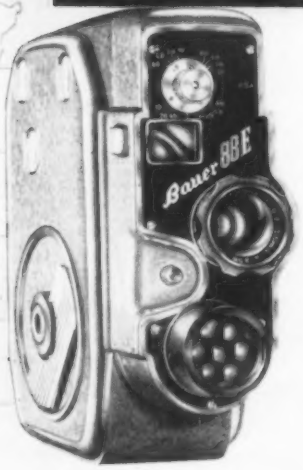

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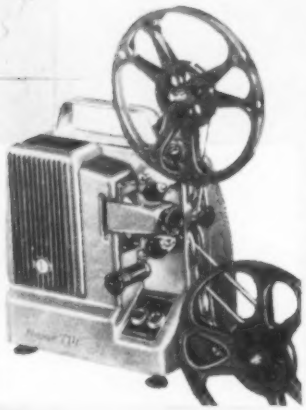

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index and lens aperture, and automatically sets the shutter speed required for proper exposure. If you change any of these three variables—exposure index, aperture, or the intensity of the light falling on the cell—the camera immediately changes shutter speed and indicates the new setting in a window on top of the camera.

The popular 8-mm electric-eye movie cameras use the tiny current generated by a photo cell to control a pair of practically weightless metal masks that pivot to change lens aperture. This approach is not practical with the much larger diameter 75-mm lens on the 66. Instead, Agfa uses the photo cell current to move a lightweight arm which covers or uncovers tiny perforations on the top of an air drum. This, in turn, regulates a piston which is mechanically linked to the shutter. Thus, a sensitive electrical system controls a pneumatic-mechanical system which actually performs the heavy work of changing shutter-speed settings.

Shooting with the Automatic is a good bit simpler than explaining how it works. First, the ASA dial on top of the camera is set to the proper film speed. Turn both the shutter and round switch next to the automatic shutter speed window to the green "A" for automatic operation. Set the diaphragm ring to the desired *f*-stop. Since it is best to know what shutter speed the camera has planned, place the Automatic in picture-taking position and observe the shutter speed indicated in the window. If it is too fast or too slow, adjust the diaphragm to change to a more desirable shutter speed. The automatic shutter is accurate over a 1/15 to 1/250 second range, and red areas above and below these speeds in the indicator window warn of incorrect exposure. If you wish to shoot at a different shutter speed than the camera indicates, simply change to another *f*-stop—the shutter speed will readjust immediately.

Agfa's pilot model shown at Photokina had only the fully automatic pneumatic shutter, arousing biting comment in the photographic press. There was no choice but to accept the exposure dictated by the camera, and if the camera considered the light level too low for correct exposure, it simply locked the shutter release.

In its present form, however, the Automatic 66 provides a second manually-set shutter, a Prontor with conventional geared timing, 1 to 1/300 second speeds, MX synchronization, and a self-timer, which can override completely the automatic mechanism.

The rest of the camera is quite conventional. Its 2¼-square format gives twelve frames on 120 roll film. The exposure counter is self-resetting, and stops the wind knob automatically for each frame. A lever on the lens mount cocks the shutter; the body shutter release triggers either the manually-set or automatic shutter.

Though Agfa's camera predates the now popular electric-eye 8-mm movie cameras with automatic diaphragms,

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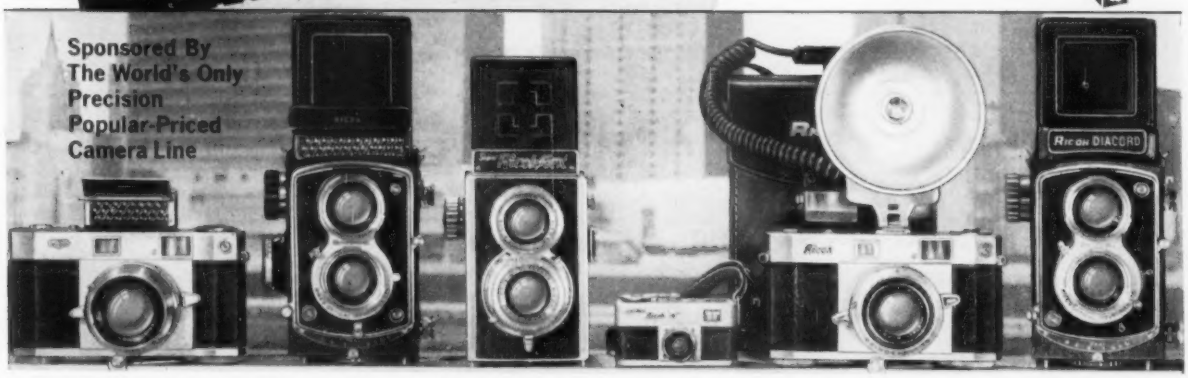

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credit for the first automatic exposure-setting camera goes to the Eastman Kodak Company. The Kodak Auto Six-20, also a folding 120 roll-film camera, sets exposure for shutter speeds from 1/25 to 1/200 seconds by automatically adjusting the lens opening. Introduced in 1938, the Auto Six-20 became a war casualty.

In evaluating the Automatic 66, we were of course most interested in the automatic exposure system. Practical tests were made to study the accuracy of the pneumatic shutter, and to determine the consistency of exposure settings under light levels ranging from the maximum automatic setting (1/15 sec at *f*/3.5) to almost the minimum (1/250 sec at *f*/22).

Our one camera gave workably consistent exposures at all light levels and *f*-stop/shutter speed combinations. However, the Automatic's entire exposure system, which depends on the same photoelectric cell as any exposure meter, requires just as much judgment on the part of the photographer in evaluating his subject as any other reflected-light meter. He must be able to recognize special subject conditions that will result in incorrect—and often unusable—exposure. Large areas of extreme brightness or darkness, strongly backlighted scenes, will bias the meter away from the best exposure.

When these special conditions are encountered with the Automatic, the camera's built-in meter may be used in close to determine exposure in important areas, then this exposure can be set on the conventional shutter. (A complicating factor here is the two different sets of shutter speeds marked on the two shutter dials: the automatic shutter reading 1/250, 1/125, 1/60, 1/30, 1/15, while the conventional shutter is marked 1/300, 1/100, 1/50, 1/25, etc.) —*Gene Gaines*

FEATURES

- Only still camera on market today with fully-automatic exposure setting system.
- Photoelectric cell automatically sets shutter speed to give correct exposure.
- Agfa pneumatic timing mechanism automatically sets speeds of special Prontor SVA shutter between 1/15 and 1/250 sec. Shutter also has conventional manually-set speeds from 1 to 1/300 and Bulb, which may be used at any time to override automatic shutter speeds. Conventional shutter has M and X synchronization, selftimer.
- Four-element 75-mm *f*/3.5 Agfa Color-Solinar lens. Diaphragm is coupled electrically to exposure setting mechanism.
- Combined range, viewfinder window with bright center rangefinder spot.
- Fully automatic film transport—no numbers or arrows to line up. Takes twelve 2¼x2¼ exposures on 120 roll film. Frame counter is self-resetting.
- Body shutter release, double-exposure prevention.
- Importer: Agfa, Inc., 515 Madison Ave., New York 22. Price: $237; case, $12.

WHAT'S NEW continued on page 36

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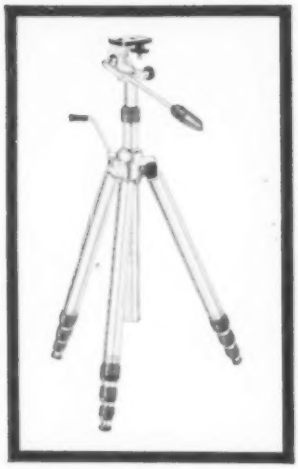

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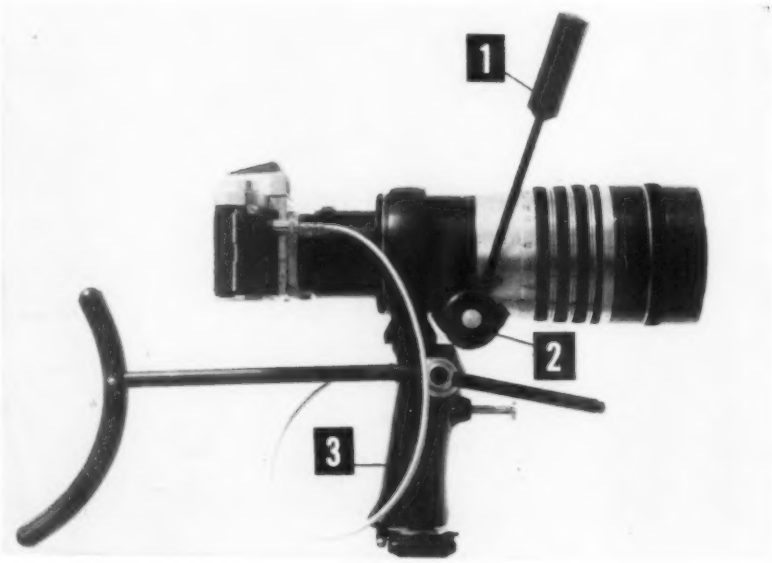

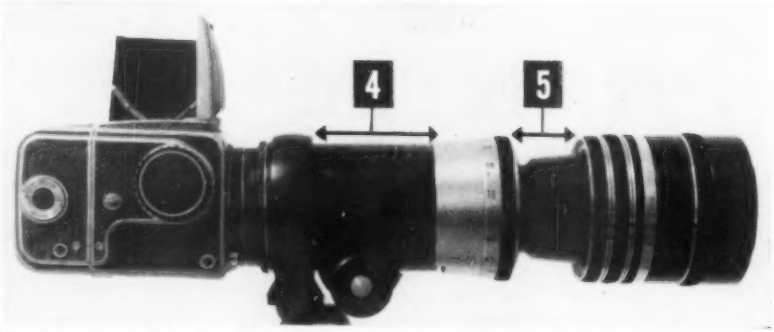

Pan-focus lever (1) pivots for rapid focusing, and fits into either of the two regular **focusing knobs (2)** which extend from sides of lens mount. Accessory **Grip-Pod (3)** combines lightweight shoulder stock, pistol grip, and trigger-type shutter release. **Lens focuses (4)** down to 9.2 ft. Second **focusing mount (5)** extends for shooting in 9.2-5.9 ft range.

THE RECENTLY RELEASED Kilfitt 300-mm *f*/4 Pan-Tele-Kilar is a 5-element double Gauss type lens specifically designed to cover the 2¼x2¼ negative format, although it will doubtlessly find its widest application with 35-mm equipment. This is a new departure in Kilfitt lens craft as all previous long-focus Kilars (which are extremely popular choices among 2¼x2¼ cameramen) were designed to cover only the 24x36-mm standard 35 format. Aside from being an extremely sharp piece of glassware (our tests indicated corner-to-corner crispness on Hasselblad negatives even at full aperture) this newest "Basic Kilar" is distinguished by its unusual mount design.

Focusing is accomplished by means of an internal rack-and-pinion movement. Less than half a turn of the rubber-covered focusing knobs extending from either side of the barrel runs the lens from infinity to the 9.2-ft close-focus point. For those in a rush, an 8½-inch long pan-focus lever (supplied with the lens) can be snapped into either of the focusing knobs by means of a spring-loaded lock mechanism.

There are two focusing ranges. In addition to the infinity-to-9.2-foot range there's a second one which twists out (à la Makro Kilar) to cover distances from 9.2 to 5.9 feet. At this distance the 300-mm Pan-Tele-Kilar fills an entire 2¼x2¼ negative with a man's face, and a 35-mm negative won't contain much more than the eyes.

As a "Basic Kilar," the new lens follows earlier Kilfitt thinking in presenting a very short mount for uses with adapters to permit the widest possible fitting to different camera makes, types, and formats. While the new lens can be used in conjunction with standard Kilfitt camera

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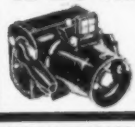

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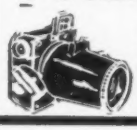

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18 x 22—Light weight semi-matte 1, 2, 3, 4 50 3.25
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Add post & Handling

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8 x 10 single weight glossy in grades 1, 2, 3, 4. Guaranteed until March 1959. Add post & handling. 100 Sheets **3.95**

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11x14	Double weight glossy	1, 2, 3, 4	50	4.89
11x14	Single weight lustre	3, 4	50	3.85
12x18	Single weight glossy	F1	100	5.95
20x24	Single weight semi-matte	1	72	6.60
24x30	Single weight semi-matte	1	100	19.50

Add post & handling

GENUINE CENTERPOLE TRIPOD

Note: Shown not fully extended

Manufacturer's List 19.95
Terrific value, supply limited. BUY NOW. Adjustable centerpole eliminates separate leg adjustments. Extends to 55", closes down to 25". Reversible head for worm's-eye view shots (see illust). Brand-New **6.95**
85¢ shpg

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90mm f6.8 Graflex Optar Sync, NEW 49.95
35mm EXA, body only 29.50
8x10 Sterling Tank (3 tanks in water jacket 19.95
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4x5 CUT FILM HOLDERS, 3 for 8.75
4x5 Kodak Stainless Steel hangers, 6 for 5.75
8x10 Kodak IIa View, w 12"—19"—25" Turner Reich in Betax 119.50
Bell & Howell Pro Tripod 89.50
4x5 Press Case, NEW 10.95
7 1/2mm f1.4 Cine lens (wide angle) 29.95
Above gov't surplus, add postage

26" RISE PRINT

STRAIGHTENER

Once thru, prints lay flat. Cast-iron base, electrically controlled. No-stretch canvas belt. Gov't surplus. Used **34.00** shpd exp

STAINLESS STEEL 40" JET ACTION WASHER

Wash 100 8x10 in 25 min. Gov't Surplus, cost $350. In original packing. **119.00** shpd exp

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For negatives to 11x14. Transparent platen, pads ensure absolute contact—permit full dodging control during exposure. Powerful 1000 watt light source instantly adjusts for distance to negative. Masking bands, pilot light, etc. Reconditioned in excellent condition. **198.50**
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120 & 620 ROLL FILM 10 for 2.29

Bargain priced Super XX film good 'til March 1959 plus 45¢ post

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7.5mm f2.5 WIDE ANGLE

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The Braun "*Plus*" features:

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ACCESSORY LENSES
for **PAXETTE automatic**
Super III

Lithagon	35mm f/3.5	$69.50
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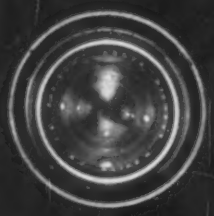
Your OLYMPUS is the most beautiful camera ever designed—at any price! It has dozens of exclusive features. These are a few:

You look through ONE window to focus, compose simultaneously. You see a brilliant Golden Frame surrounding the subject. This Frame actually MOVES as you focus! It keeps the subject centered and automatically corrects for parallax, whether you are inches or miles from the subject!

Your finger quickly catches the rapid sequence lever. A short fast stroke—ONLY 120°—automatically winds the film, counts the exposure, prevents accidental shooting, cocks the MFX shutter. If you like make 36 exposures in 36 seconds!

You glance at the Exposure Dial on the camera back, set the OLYMPUS DUAL MOVEMENT Light Value System on the lens barrel. Striking white numbers appear against the black barrel. You see all speeds—through 1/500—instantly. You see all scale settings from the top position.



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OLYMPUS

OLYMPUS with 5 element 48mm f/2.8 lens $79.95

OLYMPUS with 7 element 42mm f/1.8 and Self-Timer $114.50

OLYMPUS with 8 element 35mm f/2 WideAngle Lens $124.50

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OLYMPUS TOKYO

adapters, a special series of this flange-ware has been designed specially for its use. Eight of these incorporate a built-in holder for 2x2 gelatin filters.

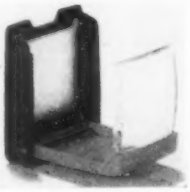
Other features of the Pan-Tele-Kilar's mount include a leveling yoke with over-sized set-screw, a pre-set diaphragm click-stopped from f/4 down to f/32, an integral lens hood, plus ribbed-rubber coatings on all working rings.

Introduced at the same time is a new Kilfitt Grip-Pod, an extremely flexible all-metal shoulder stock device which teams up with the 300-mm Pan-Tele-Kilar for steady hand-held long-lensmanship.

The Kilfitt 300-mm f/4 Pan-Tele-Kilar is packaged in a sturdy wood and metal (plush-lined) carrying case. The price (with pan-focus lever, basic adapter flange, a test-plate exposed at the factory, plus a small high-power magnifier with which to examine same) is $429. The 15½-ounce Grip-Pod lists for $24.95. Kling Photo Corp., 257 Fourth Ave., New York 10, imports the Kilfitt line from West Germany.—

MISCELLANEOUS

YASHICA 44 is a miniature twin-lens reflex camera added to the line of Yashica, Inc., 234 Fifth Ave., New York 1. It makes 12 exposures on size 127 roll film; has f/3.5 Yashikor lenses; film-advance crank; shutter speeds to 1/500 sec. B, self-timer, and MX synchronization; eye-level sportsfinder in addition to ground-glass focusing. Price, $46.50; case, $8.



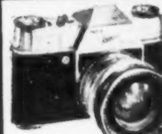
KODAK POCKET VIEWERS are out in two new folding versions. Model 1 is similar to the Kodaslide viewer but has a larger lens for improved viewing, especially of the 1½x1½-in. transparencies. Price, $2.25. Model 2 features a large "reading glass" for viewing with both eyes. Price, $2.50. Both viewers accept 35-mm, 828, and 127 size transparencies.

MICRO RECORD MOVIE FILM DEVELOPING TANK description (page 60 of the June issue) omitted some important information. This electrically operated, automatic equipment accepts up to 400 ft of film. Extra solution tanks, wash tanks, leader stock, and reels are available. Full information is available from Micro Record Co., 487 South Ave., Beacon, N. Y.

REFLECTOR CLAMP-ON LIGHTS are introduced with the electrical wire finished in red, which is claimed to prevent accidents caused by tripping over lighting wires. The unit (Model No. 419RD) is priced at $3.63. The manufacturer is Ferry Mfg. Co., Inc., 3116 Spring Garden St., Philadelphia 4.

Data and descriptions ascribed to products listed are those claimed by the manufacturer or distributors, and listings are not to be construed as endorsements by POPULAR PHOTOGRAPHY. For more details, write to address given in listing.

SAVE on NEW 1958 KODAK RETINA



Latest Models	Regular	Special
Retina Longar Tele	$80.00	$54.50
Retina Curtar f4/35mm	80.00	54.50
Curtar W. A. Lens	59.00	42.50
Retina E. R. Case	14.50	9.95

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RETINA REFLEX

Brand-New 1958 Autom. With XENON f2, built-in lightmeter, coupled to LVS; autom. diaphragm control, split image rangefinder, built-in self-timer. L.V.S., rapid wind-er. MXV shutter. Reg. $215.00 ....ONLY **$139.50**
Case reg. $15.00 Special $11.50

1958 RETINA IIIC

NEWEST MODEL of new multi-frame finder, XENON f2, built-in exposure meter, Compur MXV shutter, LVS.
Reg. $175 Only..... **$109.50**
Retina IIC reg. $132.00 ONLY $89.50

All Kodak accessories available. Write for our prices!

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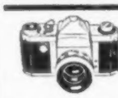
New compatible Single Lens Reflex, takes any of 130 lenses of most popular 35mm cameras. Fully automatic f1.9/50mm Soligor 6-element lens; single stroke advance; 12 speeds to 1/1000 sec.; single position speed control; interchangeable viewfinders; eyelevel penta prism. Case list $15.00—Only $10.95. List $259.50....................ONLY **$179.50**

ASAHI PENTAX



Newest, most advanced Single Lens Reflex featuring INSTANT Mirror Return, single stroke advance lever, rapid film rewind, synchr. shutter 1-1/500, penta prism. Accepts all Pentacon, Praktica lenses, etc.
Body only List $129.50............ONLY **$97.50**

W/f2.2/55mm Takumar lens $195.00......ONLY $147.50
W/f2.5/35mm W. A. Accurar $199.50......ONLY $149.50
Case Regular $15.00 ONLY $10.95

trade UP — Brand New AUTOMATIC EXAKTA VX Disc.

with Genuine IHAGEE PENTA PRISM, with Split Image RANGEFINDER *AND*

- f2.8/Automatic WESTANAR ....ONLY **159.50**
- f2.8/Automatic TESSAR ......ONLY **179.50**
- f2 Automatic BIOTAR ......ONLY **209.50**
- f1.9/Automatic QUINON ......ONLY **219.50**
- f1.9/Automatic XENON ......ONLY **219.50**
- Brand-New Eveready Leather Case.... **8.95**

Latest Automatic Flash Model EXACTA VX IIa

- Single Flashposts for Strobe, Regular FP bulbs—newly engineered shutter, fully redesigned Slow-Speed & Delay Mechanism—Accidental Exposure Prevention even with Penta Prism in Camera. ONLY

BODY ONLY: $115.00.

$44.50 Plus Your Exakta VX (body for body)

Automatic EXAKTA VX Outfit

Automatic EXAKTA VX, used; Automatic BIOTAR 58mm/f:2; Eyelevel Penta Prism w/Split Image Rangefinder	$392.00	
Brand-New f3.5/135mm Tele Preset	44.20	
Brand-New Extension Tube Set	24.00	
Brand-New E.R. Leather Case	12.00	
Brand-New BC Flashgun	15.50	
Regular	487.70	

Free Exposure Meter
Regular $487.70
OUR PRICE $224.50

Latest BRAND NEW EXA MX Outfit

Free Exposure Meter

- Latest Brand-New EXA MX....
- f2.9/50mm Meritar ctd. Preset lens
- Penta Prism Finder
- Split Image Rangefinder Insert.
- Extra Ground Glass Insert.....
- B.C. Flashgun
- Eveready Leather Case

Regular List $219.50
OUR PRICE $89.50

50mm f3.5 Zeiss Tessar instead of Meritar add $11.50. 50mm f2.8 Automatic Westanar instead of Meritar add $29.50.

Latest Model PRAKTICA FX 3 Outfit

Brand-New latest Autom. PRAKTICA FX 3; Brand-New 50mm f2.8 Autom. WESTANAR	$149.50
Brand-New 100mm f4.5 WESTAR Telephoto	44.50
Brand-New Extension Tube Set	25.00
Brand-New Eveready Leather Case	12.00
Brand-New BC Flashgun	15.50
BUILT-IN AUTOMATIC SPLIT IMAGE RANGEFINDER GROUNDGLASS	35.00
	$281.50

FREE Exposure Meter
ONLY $144.50

Sensational LOW Prices on Brand New PRAKTICA FX-3

w/f2.8 Auto WESTANAR. List $149.50. ONLY **$99.50**
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PRAKTICA FX-2
w/f1.9 Primoplan P.S. $139.50 **$89.50**
f2.8 Tessar P.S.. 139.50 **89.50**

BRAND NEW KALIMAR SINGLE LENS REFLEX 2¼ x 2¼

Interchangeable Lenses Speeds up to 1/500 sec.

	Reg. Price.	ONLY
Kalimar Reflex with 80mm f3.5 lens P.S.	$99.50	$74.95
Eveready Case		9.95
150mm f4 Tele P.S.	79.50	59.95
52mm f3.5 W.A.P.S.	99.50	74.95
3 Ext. Tube Set	12.95	9.95

AUTOMATIC TELEPHOTO FOCUSING

Every Shot —Right On The Mark!

Amazing NOVOFLEX TRIGGER MOUNT allows you to follow focus while holding camera steady with one hand only! Other hand always on shutter release, ready for Top Action Shots! NOVOFLEX Follow-Focus Lens. 240mm f4.5. Reg. $249.50. For Exakta, Praktica, Praktina, Pentacon, etc. ....ONLY **$149.50**

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Leica IIIF w/Summitar f2	$137.50	Nikon S2 w/f2	$139.50
Leica IIIF w/Summicron f2	179.50	Nikon S2 w/f1.4	178.50
Leica IIIG w/Elmar f2.8	154.50	Nikon S2 w/f1.1	239.50
Leica IIIG w/Summicron f2	209.50	28mm f3.5 Nikkor	87.50
Leica M3 w/Summicron f2	289.50	35mm f3.5 Nikkor	49.50
Summaron f3.5/35	59.50	35mm f2.5 Nikkor	86.50
Elmar f4/90	59.50	85mm f2 Nikkor	87.50
Elmar f4/90 collaps.	99.50	105mm f2 Nikkor	98.50
		135mm f3.5 Nikkor	87.50

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The finest Single Lens Reflex features:
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ONLY............... **$139.00** and up

CONTAFLEX III

w/f2.8 Tessar, fully autom. interch. lenses; Split Image Rangefinder, L.V.S., MX shutter; built/in selftimer; Built/in autom. diaphragm control f. all lenses.
New 1958 Model.
Reg. $176.00 .ONLY **$125.50**
Contaflex IV (w/built-in lightmeter).
Reg. $199.50 .ONLY **$139.50**
E.R. Deluxe Case List $14.00. ONLY $9.95

Brand-New Genuine Ihagee PENTA-PRISM

f. Exaktas, V, VX & Exas! Split Image Rangefinder comb. w/ viewfinder. ONLY **$34.95**

ACCESSORIES

For Exakta, Praktica, Pentacon, Praktina FX

BRAND-NEW	LIST	OUR PRICE
Novoflex Ext. Bellows, single car	$34.50	$24.50
Novoflex Double Ext. Bellows	59.50	42.50
Novoflex Extend Bellows, lens hood	14.25	10.50
Novoflex Slide Copy Device	22.50	15.50
Leather Case for Bellows	10.00	7.00
EXAKTA ONLY:		
Ihagee Type Ext. Tube Set	24.00	8.95
Ihagee Type 2 in 1 Adapter	10.00	5.95
Ihagee-type Microscope Adapter	24.00	9.95
Ihagee Waist Level Finder	20.00	13.95
Ihagee Penta Prism RF	85.00	37.50
Ihagee Eveready Case	12.00	8.95
Ihagee Deluxe Eveready Case	15.00	10.95
Ihagee Body Caps	1.50	.85
Ihagee Eye Piece for Penta Prism	6.00	4.95
Ihagee Range Finder Glass for P.P.	35.00	8.95
PENTACON ONLY:		
Ext. Tube Set	12.95	4.95
Folding Bellows	19.95	10.95
Eye Piece	9.95	5.95
Extension Bellows	34.50	19.95
Distance Carriage	18.50	9.95
Focusing Eye Telescope	24.50	14.95
Rotatable Angle View Finder	59.50	39.95
Sports Finder	19.95	11.95
Case for Pentacon	15.00	9.95
Deluxe B. C. Flashgun	15.50	9.95
PRAKTINA FX only:		
Rapid-Sequence Spring Motor	69.50	51.95
Microscopic Eyepiece	30.00	22.95
Extension Bellows	59.50	43.95
Extension Tube Set, 2 adapters	20.00	12.95
Microscope Adapter Set	29.50	14.95
Special Ext. Tube Set	12.00	7.95
Waist-level Reflex Viewfinder	20.00	13.95
Ground Glass Focusing Screen	3.95	2.95
Leather Case for Waist-level	3.00	2.25
Deluxe Leather Eveready Case	15.00	10.95
Rubber Eye Cup	6.00	4.50

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Genuine C.Z. Jena AUTOMATIC 50mm f2.8 Tessar. Regular $100.00.
ONLY $59.95

BRAND-NEW LENSES

for EXAKTA, EXA, CONTAX D, PRAKTICA FX, PRAKTIFLEX, CONSOL, PENTACON, HEXACON

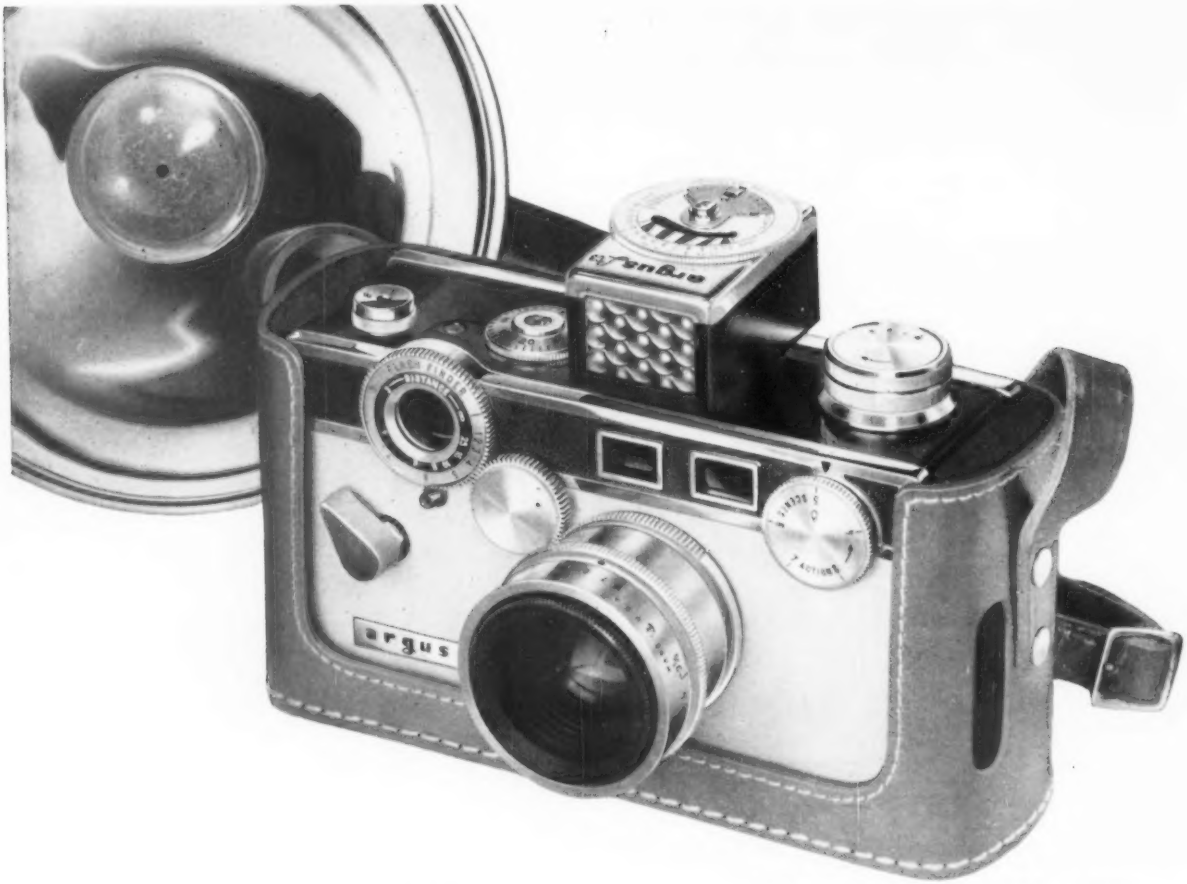
	Reg. List Price	Our Price
ANGENIEUX		
f3.5 28mm Angenieux PS	$120.00	$ 84.00
f2.5 35mm Angenieux PS	99.50	69.50
f1.8 90mm Angenieux	149.50	105.00
f2.5 90mm Angenieux	94.50	63.95
f2.5 135mm Angenieux	179.50	125.60
f3.5 135mm Angenieux	89.50	63.00
f4.5 180mm Angenieux	96.00	66.00
ZEISS		
f2.8 35mm Flectagon Autom.	149.95	89.50
f2 58mm Biotar Autom.	165.00	94.50
f2.8 50mm Tessar Autom.	100.00	59.50
f1.5 75mm Zeiss Biotar PS	216.50	139.50
f4.0 135mm Zeiss Triotar PS	85.00	62.50
f2.8 180mm Zeiss Sonnar PS	395.00	199.50

35mm/f3.5 AUTOMATIC Wide Angle

Famous Make. Coated, color-corrected. 6-element lens system, exceptional sharpness. For Exakta.
Regular $99.50 ONLY **$55.50**
OUR SPECIAL, LIMITED TIME ONLY!

	Reg. List Price	Our Price
KILFITT		
f2.8 40mm Microkilar E PS	119.50	83.50
f2.8 40mm Microkilar D PS	139.50	97.50
f2.8 90mm Microkilar PS	249.50	175.00
f3.5 150mm Tele-Kilar PS	164.50	114.50
f5.6 300mm Tele-Kilar PS	197.50	137.50
f5.6 400mm Fern Kilar PS	249.50	175.00
f5.6 600mm Fern Kilar	629.00	440.00
SCHNEIDER		
f2.8 35mm Curtagon	149.50	109.50
f1.9 50mm Xenon Autom.	169.50	109.00
f3.5 135mm Tele-Xenar, Autom.	144.50	99.50
f5.5 200mm Tele-Xenar PS	99.50	75.00
f5.5 360mm Tele-Xenar PS	189.50	133.50
STEINHEIL		
f2.8 35mm Quinaron	149.50	104.50
f3.5 40mm Cassaron	54.50	38.50
f1.9 55mm Quinon Autom.	169.50	109.50
f2.8 85mm Culminar	65.00	45.50
f2.8 135mm Quinar, PS	149.50	99.50
f2.8 135mm Quinar, Autom.	189.50	139.50
f4.5 200mm Tele-Quinar, PS	149.50	99.50

*Most lenses available for PRAKTINA—add $5.00



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. . . an EVS version of the world's most popular color-slide camera!

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	Cash	Down Payment
127mm f4.7 Optar	$495.00	$49.00
127mm f4.7 Kodak Ektar	$485.00	$48.00
135mm f4.5 Schneider Xenotar	$580.00	$58.00
135mm f5.6 Schneider Symmar	$490.00	$49.00
150mm f2.8 Schneider Xenotar	$610.00	$61.00
150mm f5.6 Schneider Symmar	$530.00	$53.00
152mm f4.5 Kodak Ektar	$495.50	$49.50
152mm f6.8 Goerz Golden Dagor	$545.00	$55.00
162mm f4.5 Optar	$514.00	$51.00
203mm f7.7 Kodak Ektar	$481.00	$48.00

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Bolex C-8 Lytar f2.5	$ 89.95	$ 8.99
Bolex C-8 Lytar f1.9	119.95	11.95
Bolex B-8 Ysar f2.5	119.50	11.95
Bolex B-8 Ysar f1.9	149.50	14.95
Bolex B-8 VS Ysar f1.9	164.50	16.45
Bolex H-8 Leader, Lytar f1.9	229.50	22.95
Bolex H-8 De Luxe, Lytar f1.9	299.50	29.95
Bolex H-16 Leader, Lytar f1.9	229.50	22.95
Bolex H-16 Reflex, Pizar f1.5	482.50	48.25
Bolex H-16 Reflex, Switar f1.4	535.50	53.55

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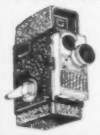
Rolleiflex 3.5G Planar w/meter	$266.95	$27.00
Rolleiflex 3.5G Planar w/o meter	$231.95	$23.00
Rolleiflex 2.8E w/meter	$327.95	$33.00
Rolleiflex 2.8E w/o meter	$277.95	$28.00

B&H 8mm Electric Eye



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		EXA	EXAKTA VX IIA	PRAKTICA FX 3	PENTACON	PRAKTINA	MIRANDA	ASAHI-PENTAX	EDIXA REFLEX A	EDIXA REFLEX D
Camera Box Without Lens	List Price New	59.50	229.50	89.50	125.00	139.50	175.94	139.50	119.50	129.50
	Our Price New	47.00	★	69.50	85.00	★	139.00	102.00	94.50	102.50
	Used Price	35.00	—	49.50	59.00	89.50	89.50	79.50	59.50	69.50
With LENSES										
Auto Westenar 50mm f2.8	List Price New	129.00	299.50	149.50	194.50	—	244.50	209.00	189.00	199.00
	Our Price New	102.00	★	118.00	139.50	—	193.00	165.00	149.50	157.00
	Used Price	69.50	169.50	79.50	99.50	—	159.50	120.00	99.50	110.00
Auto Westagon 50mm f2	List Price New	169.50	339.60	179.50	235.00	—	294.95	249.50	229.50	229.50
	Our Price New	134.00	—	140.00	169.50	—	230.00	195.00	181.50	181.50
	Used Price	99.50	199.50	110.00	119.50	—	199.50	149.50	159.50	160.00
Auto Xenon 50mm f1.9	List Price New	229.00	399.00	259.00	—	—	354.50	309.00	289.00	299.00
	Our Price New	180.00	★	200.00	—	—	280.00	245.00	228.00	235.00
	Used Price	139.50	225.00	179.50	—	—	225.00	199.50	179.50	185.00
Auto Quinon 55mm f1.9	List Price New	239.00	399.00	259.00	—	299.50	354.50	309.00	289.00	259.50
	Our Price New	188.50	★	200.00	—	★	280.00	245.00	228.00	205.00
	Used Price	140.00	225.00	189.50	—	199.50	225.00	199.50	179.50	159.50
Auto Tessar 50mm f2.8	List Price New	159.00	333.00	179.00	—	—	239.50	284.95	219.50	229.50
	Our Price New	126.00	★	142.00	—	—	189.00	225.00	173.50	181.50
	Used Price	98.00	189.50	99.50	—	—	149.50	179.50	139.50	150.00
Auto Biotar 58mm f2	List Price New	222.50	399.00	252.50	—	297.50	347.95	302.00	282.00	292.00
	Our Price New	175.00	★	195.00	—	★	275.00	235.00	222.00	230.00
	Used Price	139.50	215.00	150.00	—	199.50	219.00	199.50	199.50	205.00
Soligor pre-set 50mm f1.9	List Price New	—	—	149.00	185.00	—	299.95	—	179.50	189.50
	Our Price New	—	—	118.00	139.50	—	237.00	—	140.00	149.50
	Used Price	—	—	99.50	109.50	—	199.50	—	99.00	109.00
Auto Soligor 50mm f1.9	List Price New	—	—	179.45	—	—	259.95	—	209.50	219.50
	Our Price New	—	—	142.00	—	—	205.00	—	165.50	173.50
	Used Price	—	—	119.00	—	—	159.50	—	139.00	150.00
Takumar 55mm f2.2	List Price New	—	—	145.00	180.00	—	—	195.00	174.50	184.50
	Our Price New	—	—	114.50	129.00	—	—	155.00	137.95	145.75
	Used Price	—	—	99.50	89.50	—	—	99.50	119.50	125.00
Cassar 50mm f2.8	List Price New	—	—	109.50	145.00	—	—	—	139.50	149.50
	Our Price New	—	—	86.50	99.50	—	—	—	110.00	118.00
	Used Price	—	—	69.50	79.50	—	—	—	69.50	79.50
Xenar 50mm f2.8	List Price New	—	—	129.50	165.00	—	—	—	159.50	169.50
	Our Price New	—	—	100.00	116.00	—	—	—	126.00	140.00
	Used Price	—	—	89.50	99.50	—	—	—	100.00	110.00
Auto Travenar 50mm f2.8	List Price New	—	—	139.50	—	—	—	—	204.50	204.50
	Our Price New	—	—	110.00	—	—	—	—	161.50	161.50
	Used Price	—	—	99.50	—	—	—	—	129.50	129.50

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		LEICA M3	LEICA IIIG	CANON VT	CANON L-1	NIKON S-2	NIKON S-3	NIKON SP	CONTAX IIA	CONTAX IIIA	MIRAMBA
Camera Box Without Lens	List Price New	297.00	163.50	210.00	192.00	195.00	205.00	265.00	179.00	209.00	174.95
	Our Price New	★	★	165.90	150.00	★	★	★	★	★	130.00
	Used Price	150.00	90.00	110.00	100.00	100.00	—	—	90.00	110.00	100.00
With LENSES											
Elmar 50mm f3.5	List Price New	363.00	222.00	268.50	250.50	—	—	—	—	—	243.50
	Our Price New	★	★	212.00	195.00	—	—	—	—	—	192.50
	Used Price	199.00	133.00	149.50	139.50	—	—	—	—	—	150.00
Elmar 50mm f2.8	List Price New	372.50	234.00	280.50	262.50	—	—	—	—	—	255.50
	Our Price New	★	★	220.00	200.00	—	—	—	—	—	199.50
	Used Price	240.00	153.00	179.50	169.00	—	—	—	—	—	160.00
Summicron 50mm f2	List Price New	444.00	309.00	355.50	337.50	—	—	—	—	—	330.50
	Our Price New	★	★	280.00	265.00	—	—	—	—	—	260.00
	Used Price	230.00	199.00	225.00	200.00	—	—	—	—	—	199.50
Summarit 50mm f1.5	List Price New	474.00	337.50	384.00	366.00	—	—	—	—	—	358.95
	Our Price New	★	★	305.00	290.00	—	—	—	—	—	285.00
	Used Price	250.00	220.00	245.00	225.00	—	—	—	—	—	225.00
Zunow 50mm f1.1	List Price New	546.50	412.50	459.40	441.50	444.50	454.50	514.50	428.50	458.50	434.50
	Our Price New	430.00	325.00	365.00	348.00	350.00	360.00	405.00	325.00	365.00	345.00
	Used Price	330.00	220.00	290.00	280.00	265.00	275.00	—	225.00	255.00	229.50
Canon 50mm f2.8	List Price New	369.00	232.50	277.00	259.00	—	—	—	—	—	253.95
	Our Price New	291.00	183.00	215.00	205.00	—	—	—	—	—	200.00
	Used Price	200.00	140.00	149.50	149.50	—	—	—	—	—	150.00
Canon 50mm f1.8	List Price New	432.00	288.50	333.00	315.00	—	—	—	—	—	309.95
	Our Price New	340.00	227.00	261.00	249.00	—	—	—	—	—	245.00
	Used Price	220.00	164.00	185.00	165.00	—	—	—	—	—	189.50
Canon 50mm f1.5	List Price New	475.00	321.50	376.00	358.00	—	—	—	—	—	352.95
	Our Price New	375.00	253.00	295.00	280.00	—	—	—	—	—	278.00
	Used Price	240.00	179.00	210.00	199.00	—	—	—	—	—	225.00
Canon 50mm f1.2	List Price New	557.00	413.50	458.00	440.00	—	—	—	—	—	434.95
	Our Price New	440.00	326.00	362.00	347.00	—	—	—	—	—	343.00
	Used Price	275.00	240.00	235.00	220.00	—	—	—	—	—	295.00
Nikkor 50mm f2	List Price New	442.00	298.50	345.00	327.00	301.00	309.50	371.00	285.00	315.00	293.95
	Our Price New	349.00	235.00	272.00	258.00	★	—	—	225.00	248.50	232.00
	Used Price	240.00	160.00	160.00	140.00	149.50	—	—	109.50	199.50	189.00
Nikkor 50mm f1.4	List Price New	496.50	353.00	399.50	381.50	346.50	355.00	416.50	330.50	360.50	339.50
	Our Price New	390.00	278.00	315.00	300.00	—	—	—	260.00	285.00	268.50
	Used Price	270.00	189.00	220.00	200.00	189.50	—	—	199.50	225.00	195.00
Nikkor 50mm f1.1	List Price New	622.00	478.50	525.00	507.00	494.50	504.50	564.50	479.50	508.50	484.50
	Our Price New	490.00	377.00	415.00	400.00	★	★	★	385.00	400.00	385.00
	Used Price	—	—	325.00	310.00	295.00	—	—	289.50	325.00	298.00
Sonnar 50mm f2	List Price New	—	—	—	—	224.00	324.00	384.00	298.00	328.00	303.95
	Our Price New	—	—	—	—	176.00	255.00	303.00	—	—	240.00
	Used Price	—	—	—	—	139.50	—	—	199.50	225.00	149.50
Sonnar 50mm f1.5	List Price New	—	—	—	—	244.00	344.00	404.00	318.00	348.00	323.95
	Our Price New	—	—	—	—	199.50	272.00	320.00	—	—	256.00
	Used Price	—	—	—	—	155.00	—	—	224.00	258.00	179.50

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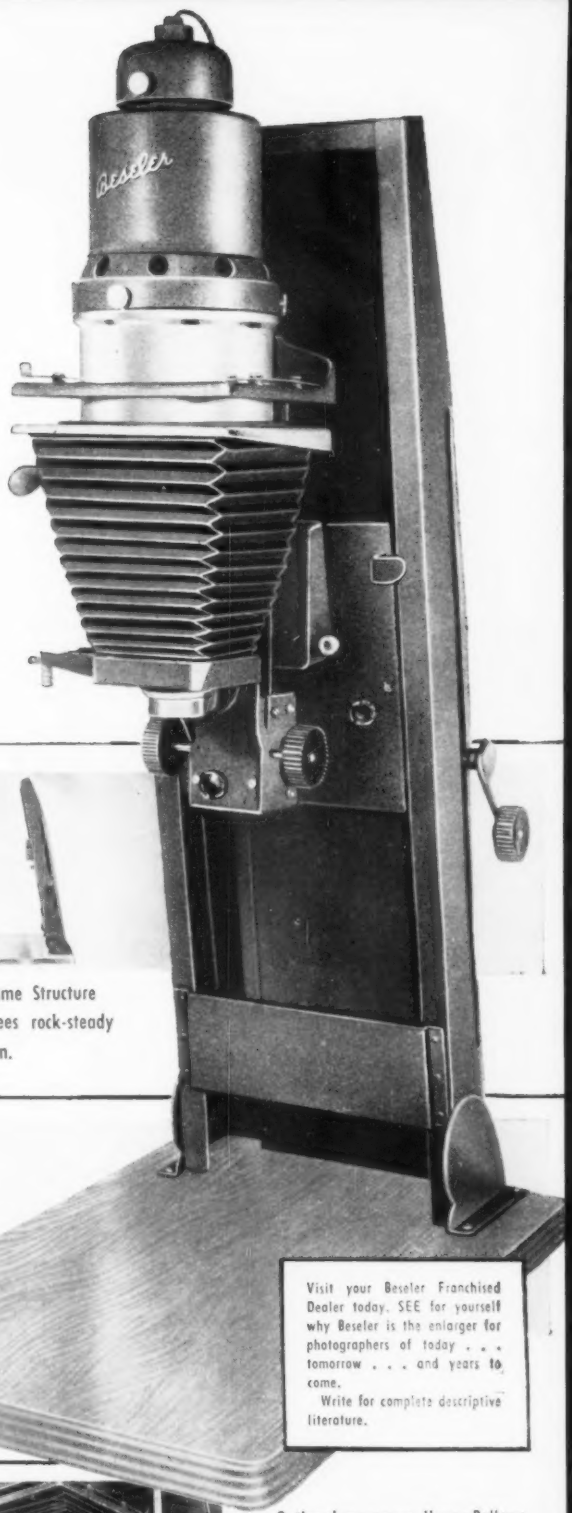

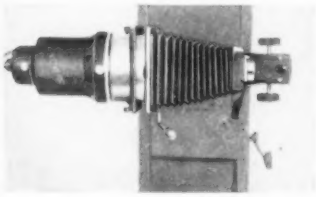

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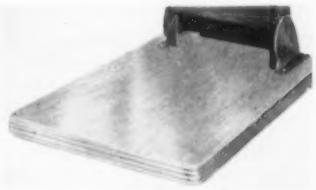

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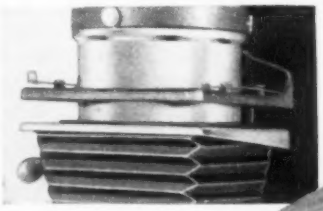

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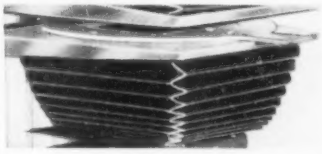
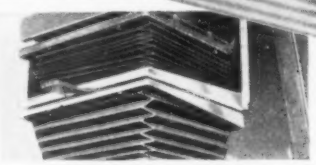


Controlled Tension Negative Stage locks simply . . . swiftly . . . into a light-tight unit.



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The Range

Editorial

Ethics in Advertising

Readers of POPULAR PHOTOGRAPHY will be glad to learn that a code of ethical practices for use in advertising and selling photographic products recently went into effect as the result of a series of meetings of the Better Business Bureau in cooperation with the Guild of Photographic Dealers of New York, Inc. The code was designed to protect the consumer from the questionable practices that had crept into the industry in recent years, and thus to restore and maintain public confidence.

The code is mainly concerned with advertising. "Bait" ads, tricky pricing, such descriptions as "like new" for used merchandise, careless use of phrases like "money back guarantee," and "factory to you," when obviously the advertiser is a middleman, are special targets of the code. Advertising repackaged and/or outdated film, without so stating, is taboo, and discontinued merchandise must be described as such.

POPULAR PHOTOGRAPHY has maintained its leadership through the years by serving and protecting the interests of its readers, whose confidence it considers its most valued asset. It has maintained unremitting vigilance over its advertising columns in an effort to keep out dishonest advertisers. This has been a tough job, and we have always leaned heavily on our readers to help us spot violators by reporting them. These readers have helped enormously in keeping the incidence of irresponsible advertising to a minimum. The code of ethical practices, which has the support of the entire photographic industry, adds a powerful new weapon to the policing job. This means greater-than-ever protection to readers.

POPULAR PHOTOGRAPHY therefore applauds this latest move to correct abuses that have cast shadows over the entire industry in recent years, and promises to help enforce the code not only by banning violators from its advertising columns but by reporting offenders to the Better Business Bureau for appropriate corrective action. We hope that our readers will continue to help us in this important vigil.

Next month

POPULAR PHOTOGRAPHY 35 mm

A SPECIAL ISSUE

FULL REPORT ON 35-MM KODACOLOR

Is 35-mm breeding a generation of sloppy photographers?

SEEING WITH A SINGLE-LENS REFLEX

How to get the most from your built-in exposure meter

35-MM PROCESSING FOR DUFFERS

finder News and comment by the editors

Seen any pictures taken from the moon lately?

AS THIS ISSUE goes to press, there is no such thing as a picture taken from the moon. But at today's rate of interplanetary, outer-spatial, extraterrestrial progress, it's entirely possible that moonside pictures will be commonplace by the time you read these words. In preparation for the great age of space photography, you'll be reading our trail-breaking lead story, *Photography in the Space Age*, by Lloyd Mallan. We had originally conceived a much more limited article, covering only the applications of cameras in earth satellites. On discussing it with Mallan, we soon found there was much more to it—and were sure that we had picked the right man to do the job. Lloyd was within a few days of departure for Russia on a book assignment, and to save time he talked on tape with features editor John Durniak, who then built the story out of the conversation. It worked out well, and we're proud of it. And we're anticipating a follow-up story when Lloyd gets back, on how the Soviets are using photography in space.

Spaceman Mallan

New contest for old!

On pages 48-49 of this issue you'll find the announcement of a sensational new kind of contest, which this year replaces the traditional $25,000 International Picture Contest. This one is *not* a picture contest, but rewards the winners with opportunities to shoot pictures of exotic places in the far corners of the world. Readers who have never felt up to photographic competition now have a chance to win in this fabulously new kind of contest! Read the announcement for rules and entry blank.

You want to know?

We're proud that a lot of our readers think of us as a kind of friendly uncle, to whom they can bring their photographic problems and queries. We've always tried to be as helpful as we can, but we find that the job of putting out a magazine takes so much time that many readers' questions must go unanswered. To remedy the situation to some extent, we're inaugurating a new department, beginning next month, called *That's A Good Question*. To give you an idea of what it will be like, we prepared the six-page illustrated feature in this issue, *I Want to Know*. If you have a question you think would interest a lot of our readers, send it to *That's A Good Question*, POPULAR PHOTOGRAPHY, One Park Avenue, New York 16, N. Y. Sorry, we can't acknowledge or answer any which are not used in the column.

Through the Bamboo Curtain

From **Mr. Chen Han-seng**, of *China Reconstructs* ("An English-language magazine published by the China Welfare Society" in Peking) comes a belated report on China's First National Photo Show, held last December in the mainland capital. There were 321 pictures on view, selected from 3,309 submitted by 800 professionals and amateurs; 40,000 people came to see them. The magazine was particularly impressed by the return of old-fashioned portraits and landscapes, presumably discouraged by the Red regime: "That they have come into their own again is one of the results of the policy, 'Let a hundred flowers bloom and a hundred schools contend,' which is bringing a great variety of expression into all fields of art." It remains to be seen whether any expression of real individual freedom with the camera will emerge from this ultra-reactionary beginning.

A newspaper helps

We've just had word from our friend Harry A. Goldstein, who teaches photography in the Tucson, Ariz., high school, about the wonderful support he got from the Tucson *Daily Citizen* in co-sponsoring the school's photo show this year. We offer the paper our congratulations—and the same to any newspaper with such a concern for developing interest in pho-

continued on page 106

Charles D. Sharp

WHO ARE THESE PEOPLE?
What are they aiming at? See page 107.

free contest card in every set enables you to participate in annual $5000 coloring contest.

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You'll love to color your photos with Marshall's Photo-Oil Color Pencils. No previous art training or special talent is needed to color fine details and small snapshots. Each set contains 18 assorted colored pencils, accessories and full instructions—$4.75. The colors are permanent — never fade.

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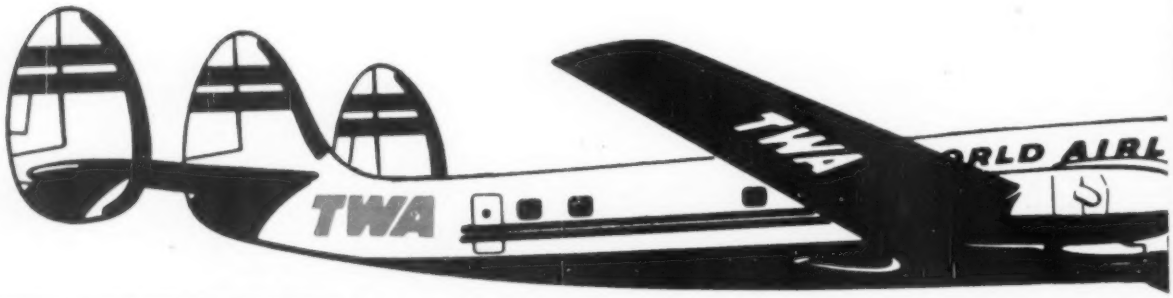
NAME _____
ADDRESS _____

POPULAR PHOTOGRAPHY presents the most unusual contest in photo history:

WIN A FREE TRIP TO PHOTOGRAPH



OFFICIAL RULES: POPULAR PHOTOGRAPHY

7 WONDERS OF THE WORLD CONTEST

1. The World is full of Wonders and no one agrees which are the 7 greatest. To enter this contest, make up your own list of 7 Wonders. These can be persons, places or events anywhere in the world you believe are most worth photographing. Then in 25 words or less explain the reason for your number one choice. Clip entry blank and paste to postcard.
2. You may enter the contest as many times as you wish but each entry must be made on an official entry blank published in POPULAR PHOTOGRAPHY. Entries must be postmarked no later than midnight, August 15, 1958, and mailed to POPULAR PHOTOGRAPHY, One Park Avenue, New York 16, New York.
3. Prizes will be awarded on the basis of originality, sincerity and aptness of thought. Judges of the contest will be chosen by the Editors of POPULAR PHOTOGRAPHY and their decisions will be final.
4. Grand prize will be a three-week trip for the winner and his guest to 7 Wonders of the World via TWA, accompanied by the Editor of POPULAR PHOTOGRAPHY. Accommodations and expenses will be arranged and paid for by AMERICAN EXPRESS TRAVEL SERVICE. Six runner-up prizes will be awarded consisting of one-week expense-paid trips to any place within the U.S.A.
5. In case of tie, duplicate prizes will be awarded. Winners will be announced in the January, 1959 issue of POPULAR PHOTOGRAPHY. The contest is subject to all U.S. and foreign government regulations on international travel, including passports, visas and health certificates.
6. The contest is open to all persons in the United States and Canada, except employees of POPULAR PHOTOGRAPHY, Ziff-Davis Publishing Company, Trans World Airlines, American Express, their advertising and public relations agencies and families of employees.
7. Publication rights to all photographs taken by the grand prize winner and his guest on the world tour belong to POPULAR PHOTOGRAPHY. All such photographs may be used by POPULAR PHOTOGRAPHY or its assigns for editorial and promotion purposes without restriction. All entries become the property of POPULAR PHOTOGRAPHY.

Here's your chance to make that next vacation an exciting expense-paid assignment for *two*—from your home to 7 Wonders of the World.

All you do is make up your own assignment of 7 Wonders—anywhere in the World—that you've always dreamed of photographing. Then add a few words explaining the reason for your number one choice.

That's all there is to it! If your entry shows the most originality, the Editors of POPULAR PHOTOGRAPHY will send you and your guest on your way to the greatest photo assignment of your life—photographing your own 7 Wonders of the World.

What's more, to make sure the grand prize winner knows how to take the kind of pictures he'll treasure for a lifetime, Bruce Downes, Editor of POPULAR PHOTOGRAPHY, will go along as personal host and photographic advisor. For three glorious weeks you'll travel and live in style!

TWA -TRANS WORLD AIRLINES will fly you and your guest to all the 7 Wonders you select. You'll travel in speed and comfort aboard world-proved TWA Skyliners, including the magnificent Jetstreams.* On TWA, you will enjoy incomparable service, and fly with world-experienced Captains for the most memorable trip of a lifetime.

AMERICAN EXPRESS Travel Service will arrange first class accommodations at each of your 7 Wonders of the World, and will provide Travelers Cheques, spendable everywhere, for your expense money—safe and convenient to use.

And if you're one of six runners-up, you'll spend a full week visiting and photographing any single Wonder of your choice within the U.S.A.

Here's a contest where a beginner has the same chance to win as an expert! Choosing 7 Wonders for this POPULAR PHOTOGRAPHY competition is an exciting challenge.

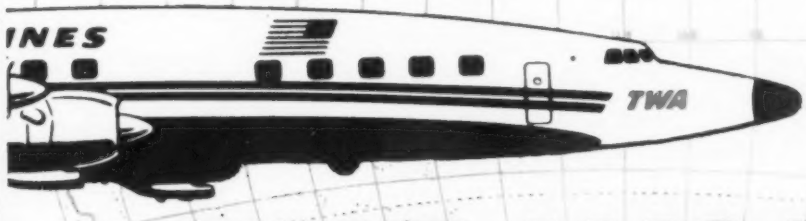
Would you include the Empire State Building on your list? Or the lost Cambodian city of Ankor-Wat? What about the pageantry of a bullfight? How would you like to photograph a human Wonder like Marilyn Monroe or Brigitte Bardot? Or watch the launching of an earth satellite? Or even climb the magnificent Matterhorn? Or visit Paris, Rome, Athens or the Far East?

All these and thousands of others are possibilities you can name, visit and photograph. So check the rules, sit down and dream up your personal list of 7 Wonders of the World. You must enter this POPULAR PHOTOGRAPHY contest before August 15. So get started today! Make your dream of a magic carpet assignment to 7 Wonders of the World come true!

**Jetstream is a service mark owned exclusively by TWA.*

TRANS WORLD AIRLINES — U.S.A. • EUROPE • AFRICA • ASIA

YOUR 7 WONDERS OF THE WORLD!



CUT OUT ON DOTTED LINE, PASTE TO POSTCARD AND MAIL TO

POPULAR PHOTOGRAPHY

OFFICIAL ENTRY BLANK

Fill out, clip and paste to 2¢ postcard. Entry must be postmarked no later than midnight, August 15, 1958.

Send to: POPULAR PHOTOGRAPHY, One Park Avenue, New York 16, New York

MY 7 WONDERS OF THE WORLD ARE:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Answer in 25 words or less:
I CHOSE MY NUMBER ONE WONDER BECAUSE:

_____

Name _____

Address _____

City _____ Zone _____ State _____

SO VERSATILE
SO PROFESSIONAL
SO FAST you're ready to shoot in just 11 SECONDS

HERE'S HOW:

LOAD FILM MAGAZINE....4 seconds
CHOOSE LENS.....1 second
CHECK METER.....2 seconds
SET LENS.....2 seconds
AIM.....2 seconds

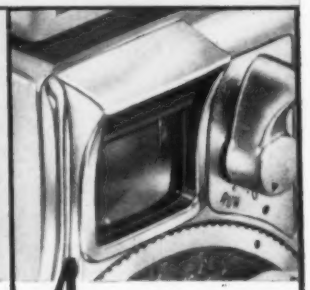
TIME ELAPSED —
ONLY 11 SECONDS!

KEYSTONE K-48 — You never saw a movie camera do so much so fast! Takes slow-motion, speeded-up action and trick shots with four speeds — 12 to 48 frames per second. And the Quick-Shift turret gives you interchangeable normal, wide-angle and telephoto lenses. Price complete with lock-on, direct-reading exposure meter and 13mm *f*2.3 ff lens, $132.00; with *f*1.9 focusing lens, $152.00; complete with meter and three lenses, from $199.50.

1 Fast, Easy Magazine Loading — Full-size magazine chamber makes loading compartment easily accessible. Safety locks camera cover and opens magazine shutter in one motion.

2 Zoom-Type Viewfinder — Slide the button and you immediately get a perfect view of what each lens "sees" without reducing field of vision.

3 Lock-On Direct-Reading Exposure Meter — Color-coded for quick reading, meter gives *f*/stops for ASA 10 and 16 film. Use it on camera or separately and be sure of perfect exposures.



4 Hooded Viewfinder Lens — saves your time and patience. No more squinting into your own lights. Visor over front finder lens assures you of a clear view always.

MONEY-SAVING OFFER on camera complete with three ultra-fast lenses. Limited time only. See your Keystone Dealer now.

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Keystone Camera Co., Inc., Boston 24, Mass.

POPULAR PHOTOGRAPHY
JULY, 1958

Photograph courtesy Mt. Wilson and Palomar Observatories

PHOTOGRAPHY IN THE SPACE AGE

BY LLOYD MALLAN

What part will the camera play in discovering the secrets of the Earth and our Universe? Who are today's space photographers? Can the camera help us predict the weather? The author, one of the nation's top science writers, answers these questions and many more about a new kind of photography.

Rose Mallan

Lloyd Mallan (shown above, standing) is among that rare group of experienced high altitude photographers that he mentions in his article. He has 150 hours of flying time on photo missions in the T-33 Shooting Star, the TF-86 Sabre, and the F-89 Scorpion turbojet aircraft. Many of his flying hours were accomplished at eight miles and higher above the earth. He is the first American photographer (and as of now there is only one other) to have photographed men floating in a condition of zero-gravity, or weightlessness—a condition that future space journalists will have to endure continually. Mallan is also the only photojournalist to have made photos of visible supersonic shock waves surrounding a high-performance airplane in flight. For scientific study such photos have also been made—but with automatic motion picture cameras. Mallan used a Canon Vt with the Canon 135-mm telephoto lens—and managed a dozen successful exposures of a very elusive phenomenon. He is the most qualified man we know of at this moment to write about space photography—not only because of his knowledge of high altitude photographic techniques, but equally because of his uniquely wide background of knowledge in all scientific fields connected with space flight. His published books are: A Guide to Astronomy and Space Satellites *(Fawcett Books)*, A Day in the Life of a Supersonic Project Officer *(David McKay Co.), and the revised edition of a classic in the field of space research and development,* Men, Rockets and Space Rats *(Julian Messner, Inc.).*

IN THIS age of space research and development, photography is one of two most important tools of the scientist, the engineer, the medical researcher, and the missile or rocket manufacturer. We often hear our present era referred to as "The Age of Electronics," but I feel that this is a rather false label. Photography today is just as important as electronics.

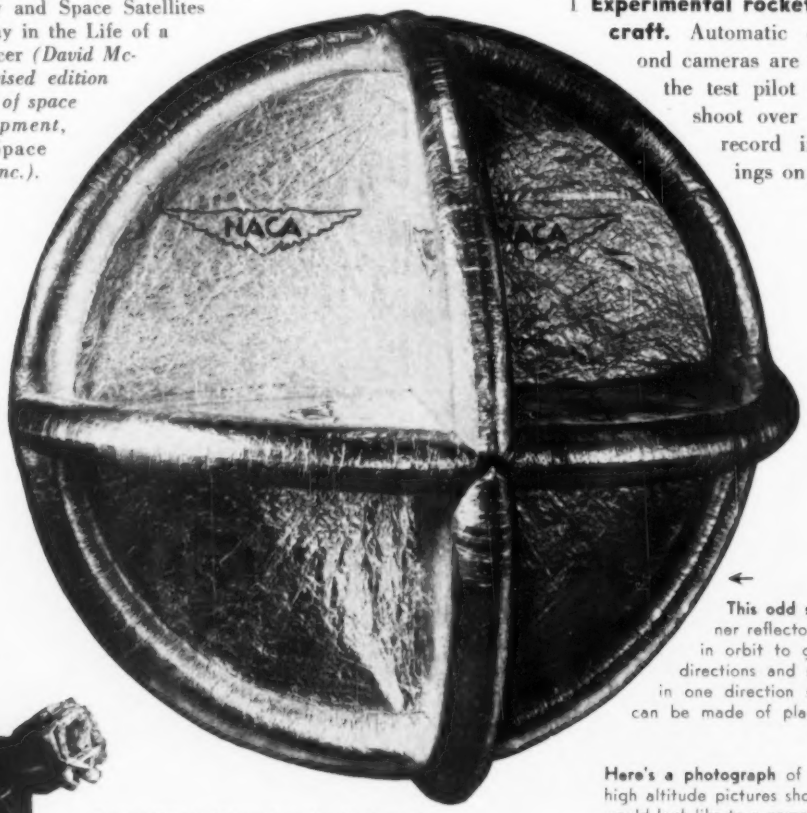
Whether we are trying to learn more about our planet, earth, or about the vast enigmatic universe, photography shares the work-load equally with electronics. You simply cannot analyze any of the forces that exist in the universe without recording them (photographically) or in terms of electronics. When you can't use one, the other works for you. Quite often they work together as a perfect technological team.

Our entire concept of the universe is based upon two techniques: first, the photographic recording of stars and the galaxies that contain them; and second, the analysis of emanations from stars, galaxies, and gas clouds in distant space. So again, electronics and photography are absolutely the only tools we have on earth right now that can define the nature of the universe to us.

Space, mankind's last great frontier, is basically dependent upon electronic and photographic methods to determine whether or not it will be conquered. It is imperative that universal forces be accurately defined if we are ever to send crews of men out into the black void—and bring them back alive.

Here are examples of only a few instances in which the camera is vitally important to space scientists.

1 **Experimental rocket-powered aircraft.** Automatic 4-frames-per-second cameras are mounted behind the test pilot and continually shoot over his shoulder to record instrument readings on his panel. Such

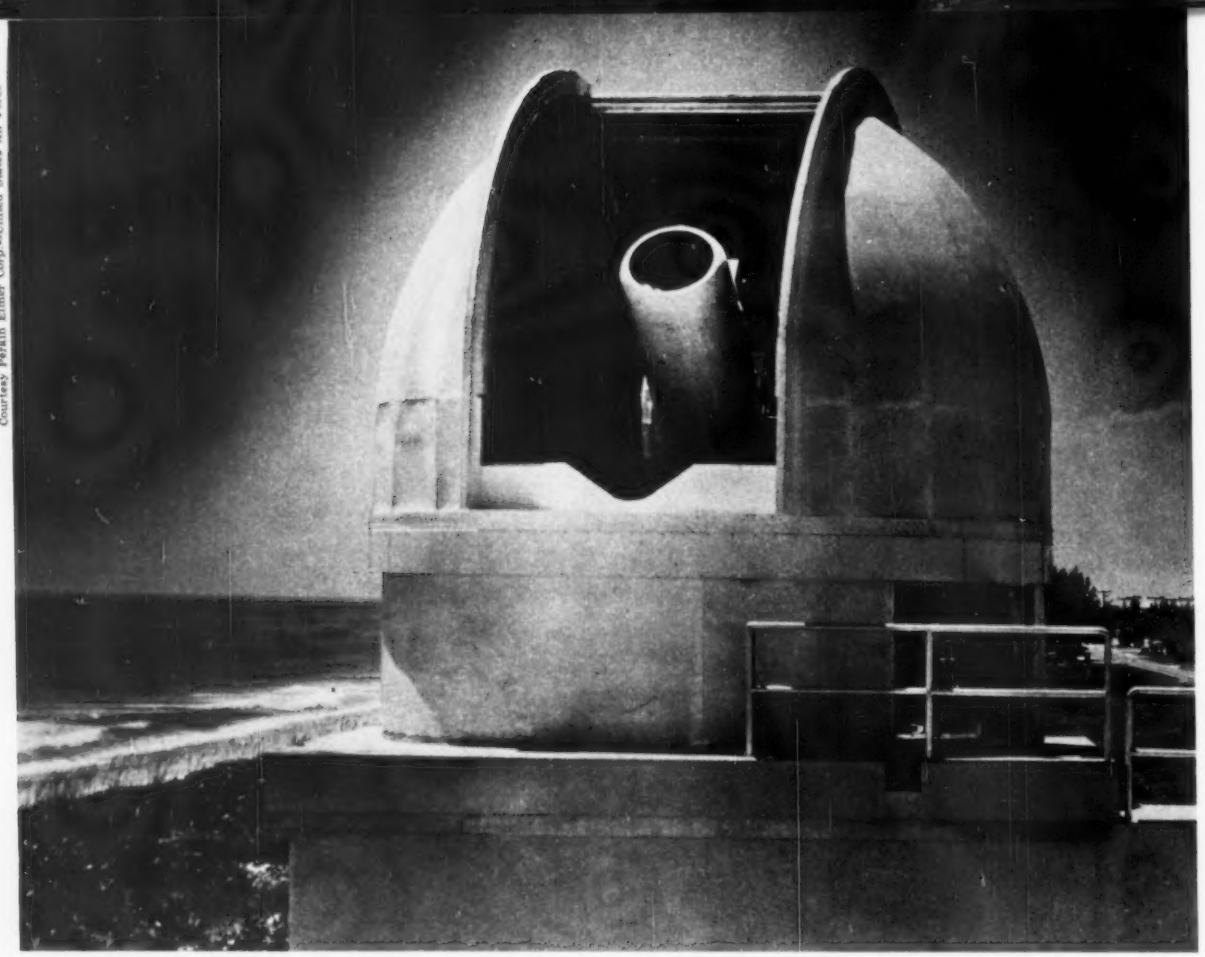


Courtesy National Advisory Committee for Aeronautics

← **This odd shaped** unit is a corner reflector. It will be shot up in orbit to gather light from all directions and send it to the earth in one direction so that photographs can be made of planets in outer space.

→ **Here's a photograph** of a model made from high altitude pictures showing what the world would look like to a camera in a satellite 4,000 miles above Amarillo, Tex. From pictures like this the United States Weather Bureau could make long-range, highly accurate predictions.

Courtesy Dr. Harry Wexler, United States Weather Bureau



Courtesy Perkin Elmer Corp.—United States Air Force

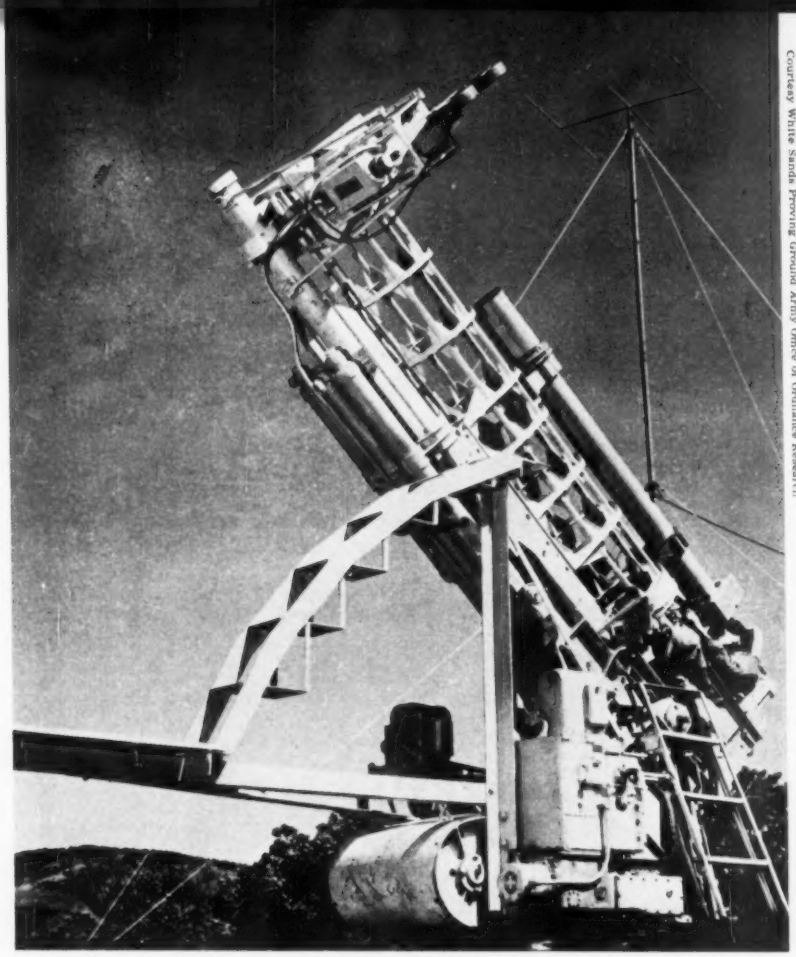
This giant camera housed in an observatory-like dome is used by the Air Force to photograph missiles. It has brought moon's surface within 200 miles of the eye.

a camera went along with Captain Iven Kincheloe, USAF, when he took the Bell X-2 rocket ship more than 24 miles up. A similar camera will be aboard the X-15 (America's first rocket-powered, manned space craft) when Kincheloe makes the maximum altitude stress flight in a couple of years from now. A camera will be in Scotty Crossfield's pressurized cabin when he makes the original functional stress runs in the X-15 next year. A few other cameras will also be on all X-15 flights, mounted in strategic positions to photograph stresses and strains on control surfaces, etc. By the way, the X-15 design will permit it to fly 400 miles out from the earth at velocities in excess of 4,000 mph.

2 **Research rockets.** Cameras have photographed the earth from as high as 600 miles (these photos are still classified secret) in rocket research vehicles such as the X-17. Any number of other unmanned research rockets and ramjets (the Viking, Aerobee-Hi, X-7) have carried cameras through the stratosphere and into the ionosphere (the region of air that begins 25 miles above the earth's surface). From ground level, special tracking cameras follow all rocket vehicles, manned and unmanned, reporting on such things as shock-wave formation in the rocket engine exhaust, stability of the airframe, exhaust-flame turbulence and action in thin atmospheres, etc. Such visually obtained technical information supplements electronically reported information and both make possible corrections and refinements of engineering design.

3 **Human factors.** The study of a human being's ability to withstand the terrific pressures of gravity (and the lack of such pressure, as in zero-gravity or weightlessness) that are encountered in high speed flight and will be a routine part of space flight is not only made with electronic recording instruments but also photographically. In some cases only the camera can define human limitations and flexibility. These are still and motion picture X-ray cameras that literally show the bones, muscles, and vital organs of a man or animal in conditions of extreme stress.

4 **Pure research.** Special cameras and/or film emulsions are used to record hypersonic shock waves in wind tunnels and shock-tubes. Study of such shock waves (caused by an object moving through air, gas, or liquid at five times or more the speed of sound) makes it possible for engineers to design the proper aerodynamic shapes for missiles and manned rockets moving through earth's atmosphere at high speeds. To escape the gravity-pull of earth will require a speed of about 25,000 mph. Cameras are also mounted on rocket sleds and all along the sled-track to record the reactions of humans, animals, airframes, and escape capsules planned to save the lives of future spaceship pilots. It is interesting to note that at the Ames Laboratory of the National Advisory Committee for



Courtesy White Sands Proving Ground Army Office of Ordnance Research

Cameras like this one are spotted through the mountains near White Sands and used to shoot satellites.

VOCABULARY FOR SPACE CAMERAMEN

AU—Astronomical Unit, roughly equivalent to 93 million miles or the distance of the earth from the sun. Used to measure interplanetary distances.

BLASTOFF:—Take-off of a missile, rocket, or spaceship.

CAMERA PLATFORM—Any air-borne or space-borne vehicle that carries a camera alone or a photographer with a camera.

CELESTIAL SPHERE — An imaginary sphere which contains the visible universe. Its North and South Poles coincide exactly with those of the earth.

CISLUNAR SPACE—Space between the earth and the moon.

DATA CAMERA—Automatic or remotely controlled camera used to collect scientific data visually.

DEEP SPACE—Space beyond the solar system.

ESCAPE VELOCITY—Speed required to escape the pull of earth's gravity, approx. 25,000 mph.

THE GALAXY—Our own Milky Way, or island universe.

INTERGALACTIC SPACE —Space between the galaxies or nebulae.

INTERPLANETARY SPACE—Space beyond the moon, between the sun and planets.

LIGHT-YEAR—Distance that light theoretically travels in one year, or approx. 6 trillion miles. Used as yardstick to measure distances to the nearer stars and nebulae.

REFRACTOR CAMERA —A telescope-camera that gathers and corrects aberrations of light through a number of lenses and stops in series.

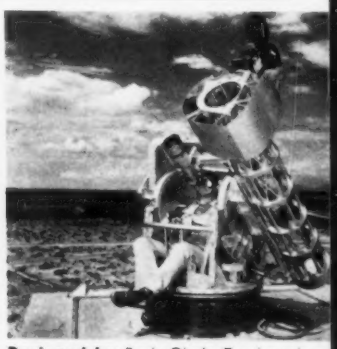
WEATHER PATROL SATELLITE—Satellite-borne cameras and photometric devices used to survey the movements of clouds, storms, etc.

Aeronautics a Polaroid Land camera is used, among other more sophisticated photographic techniques, to record shock waves at speeds as high as 18,000 mph. Cameras at the Lockheed Missile Systems Division and at the Air Force Arnold Engineering Center have photographed objects at velocities up to 30,000 mph. The Wollensak Optical Company of Rochester, N. Y., has recently perfected a motion picture camera for space research called the "Fast-air." This camera uses rotating prisms instead of a shutter to achieve frame speeds of anywhere from 12 to 600 pictures a second.

5 **Surveying space.** Cameras have been developed with super-fast lenses and an ability to explore regions of space surrounding the earth for millions of miles. As distinct from the standard-telescope cameras used by astronomers and astrophysicists, these are used to locate orbiting natural bodies between the earth and the moon as well as to record continually the action of magnetic storms on the sun. Such storms cause violent disturbances in our upper atmosphere that are felt on the earth's very surface. The data being gathered by these two types of camera will make it possible for men to navigate accurately and safely through cislunar (this side of the moon) space. Another type, the spectrographic camera, analyzes the nuclear structure or chemical content of bodies in near and deep space. Cameras are also used (*Continued on page* 94)

Courtesy Sacramento Peak Observatory

These cameras photograph meteor ionization trails 100 miles above earth.

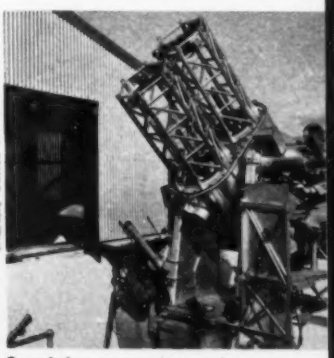


Designed by Prof. Clyde Tombaugh, this camera shoots 200 miles up in air.

Courtesy United States Air Force

Huge telescope camera records guided missiles that go 140 miles up.

Courtesy United States Army Ordnance



Special camera designed to photograph the exhaust flames of missiles.

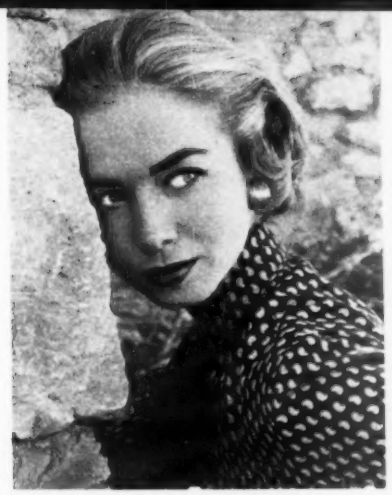
PORTRAITS OUTDOORS

Mountain boy in the Italian Dolomites posed in bright sunlight for this portrait, but Jerry Cooke chose an angle at which the boy's hat brim would cast a shadow across his face, then exposed for that shadow area. Note that highlight areas are definitely overexposed, while dark portions, like the corduroy pants, have good detail. Cooke used a Rolleiflex and fast pan film, exposing at 1/250 second, f/8, through a medium-yellow (K-2) filter.

Forest portrait was made of Peggy Ray by Wil Blanche, on their way to a beach shooting session on Long Island. Peggy stood in such leafy shade that Blanche had to shoot with the Rolleiflex at 1/60 second, f/5.6, on Verichrome Pan. Since this kind of light is variable and deceptive, careful close-range meter readings are necessary for on-the-nose exposure. Note how detail in both shadows and highlights aids modeling in face and body.

Lighting formula for faces under the summer sky: seek open shade, wait for a diffusing cloud, or brave the sun's full light—with caution

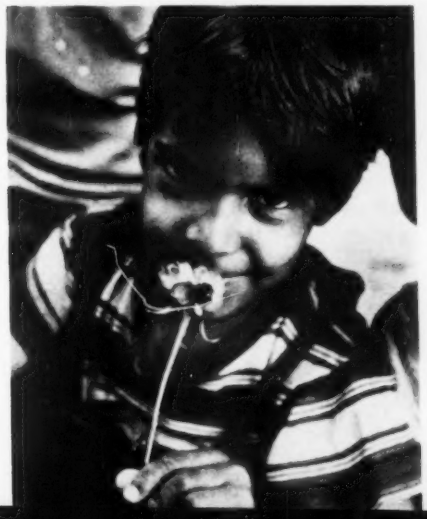
A bright sun in a blue sky—the perfect combination for picture-taking. Portraits included? Some say no, because control of the light is so limited: you can only change the subject's position or wait until the sun moves where you want it. And when the sun is very bright, faces are distorted in wrinkly squints. But in general the outdoors is a good place for portraits, because all these objections can be overcome quite simply. For example, four of the six pictures on these pages were made either in shade or under overcast skies. In the fifth, the shot of the Italian moun-



Shade versus glare: the difference is startling in this pair of portraits. James E. Kelleher photographed Merry Hunt in open shade, using a Contax and Tri-X film, at 1/100 second, *f*/8, through a light-yellow filter. Louis F. Hechenberger shot the skier in bright sunlight with a Rolleiflex, on Panatomic-X, at 1/250, *f*/5.6, with light-green filter. Violating a rule against shooting under a strong sun, he gained impact and an intensified feeling of crisp, sparkling coldness.

Girl and daisy were combined for a charming portrait by Zvonko Glyck, who found the Gypsy child in the shopping district of a summer resort. He moved her out of direct sunlight, preferring the flattering soft effect of shade on the young face. He made the picture with an Omega 120 camera and Plus-X film, exposing for 1/50 second at *f*/8. Overdevelopment of the negative brought more detail to the shadow areas, at the same time increasing contrast—to good advantage.

Boy and a rose (the flower provided by the photographer) were an appealing subject for Lies Wiegman, a young Dutch woman who was fascinated by the life of New York's streets. She was using an Exakta and Plus-X film, and the sky was only lightly overcast, so she was able to shoot at 1/150 second, *f*/5.6. This was fortunate, for the boy was enchanted with the rose and his expressions changed rapidly. High camera angle on the upturned face added to picture's appeal.



tain boy, the hat brim shades the face ideally. In the sixth, of the face-mopping skier, the squint is there, but it is neither unflattering nor inappropriate. Note the effect on exposure of the difference between bright sun and shade. Coincidentally, all six pictures were made at *f*/5.6 or *f*/8. Both bright-sun shots were made at 1/250 second; the others at 1/50 to 1/150. Especially notice how diffused sunlight—either open shade or overcast—is kind to women and children; it is no accident that it is a man's portrait that succeeds under full, glaring sunlight.—

Nick Dean

New high-resolution PolaPan 200 film rivals the quality attainable from any other b-&-w process, as this shot made in dim, late-afternoon light indicates.

POLAROID FILMS

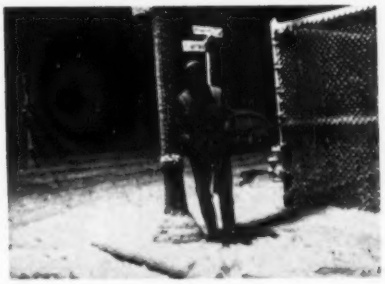
An up-to-date roundup on the 10th anniversary of picture-in-a-minute photography

By BOB SCHWALBERG

THIS FALL will mark the 10th anniversary of the Polaroid Land system of picture-in-a-minute photography which was introduced commercially on November 28, 1948, when the original Model 95 camera was first marketed. Derived from the spare-time researches of its inventor, Dr. Edwin H. Land, which were carried out during the war years, the new process was based upon an entirely new departure in the history of photography: a self-contained picture film incorporating negative and positive emulsions plus the necessary processing chemicals. The unique Polaroid Land camera served not merely as a picture-taking instrument, but also as its own portable darkroom permitting finished prints to be viewed only 60 seconds after their exposure. Despite the instantaneously enthusiastic response which swamped the company with orders for cameras and film, the process was greeted by a considerable amount of skepticism and outright criticism.

Criticism was aimed at both the camera (too big, too clumsy, too heavy, and lacking in many modern conveniences) and at the film (for its old-fashioned sepia tone, poor sharpness, inferior keeping-qualities and malfunctions such as tearing, streaking, mottling). Responding to its

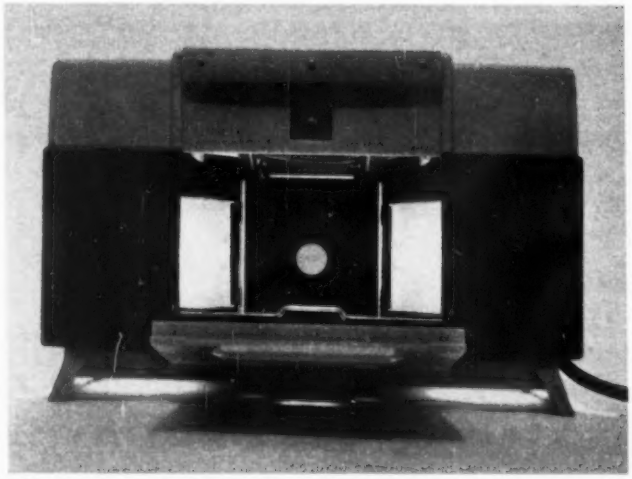
A GUIDE TO THE SEVEN POLAROID LAND FILMS

	CLASSIFICATION	EXPOSURE INDEX (ASA equivalent)	GENERAL CHARACTERISTICS
TYPE 31, 41	Medium-speed ORTHO-CHROMATIC print film	Daylight 100 Tungsten 70	A high-contrast orthochromatic *(insensitive to red)* emulsion; produces snappy prints. Suitable for most picture-taking purposes, especially good for male portraiture, low-contrast landscapes, other applications requiring high-contrast film. Has moderate exposure latitude.
TYPE 32, 42	High-speed PANCHROMATIC print film	Daylight 200 Tungsten 140	A medium-contrast panchromatic film newly improved with increased resolving power and lengthened tonal scale; the film for maximum Polaroid print quality. Highlight and shadow gradation is exceptional with deep blacks, brilliant whites. Has wide exposure latitude.
TYPE 44 	Very-high-speed PANCHROMATIC print film	Daylight 400 Tungsten 280	A low-contrast panchromatic film with twice the speed of Types 32/42 but almost as good quality. Ideal for available light and many technical applications. High speed makes it a good choice for bounce flash. Has wide exposure latitude.
TYPE 46,46-L	Superspeed PANCHROMATIC transparency film	Daylight 1,000 Tungsten 700	A medium-contrast panchromatic film for positive projection transparencies of unsurpassed brilliance, gradation, and sharpness. Extremely long gradation scale retains detail even in deepest blacks. Very wide latitude.

Series "30" films are for the smaller models 80 and 80-A Polaroid Land cameras, and produce eight 2¾x3½ prints per roll. Series "40" films fit all other models and produce eight 3¼x4¼ prints per roll. Type 46 Projection film produces 2¼x2¼ slides; Type 46-L makes 3¼x4¼ slides.

NEW FILM PLUS PRINT COPIER PRODUCES HIGH-QUALITY DUPLICATES

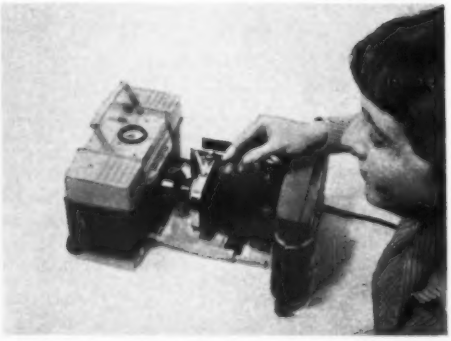
New Print Copier is housed in handsome gray and black plastic case. (All pictures on this page made with PolaPan 200 film.)



Print easel in back of Copier hinges open to reveal dual light sources with polarizing filters set at 45 degrees for even, glare-free illumination of original.

How it works

Camera is mounted so front flange touches Copier lens, distance scale is set at 3½ feet. Spring holds original print flat inside easel.



Exposure is made with shutter set at Bulb and guided by electrical timer on top of Copier. Cable release is used to prevent camera movement during exposure.

Copy print is developed in Polaroid camera using standard procedure. Contrast can be increased or decreased by altering the processing time.

critics, the Polaroid corporation introduced a total of eleven new camera models (five of which are in current production) offering greater compactness, lighter weight, and superior features (three current models have coupled rangefinders and automatically parallax-compensating viewfinders), within a space of ten years. Keeping pace with this progress in Polaroid camera design was a parade of accessories including such things as a bounce-flash bracket for the Polaroid BC flash gun and the brand-new Print Copier introduced at the MPDFA convention in Chicago last March and described in detail on the following pages.

Perhaps of even greater importance in gaining for picture-in-a-minute photography a following that may be measured by the one-and-one-half *million* Polaroid cameras that have been sold since 1948, and which now numbers some of our most outstanding professionals (including Ansel Adams, a winner in this magazine's balloting for the world's ten greatest photographers, POPULAR PHOTOGRAPHY, May 1958) is the constant improvement of the film material and the introduction of a variety of new films including one for making Polaroid transparencies. No longer is the basic print film sepia toned, nor does it tear or streak when handled with reasonable care. More than this, the quality of the newly improved PolaPan 200 is of such excellence as to place it, along with the Polaroid transparency film, in the forefront of black-and-white processes, conventional or otherwise. It requires little editorial courage, or limb-climbing, to say that the image quality (*Continued on page* 112)

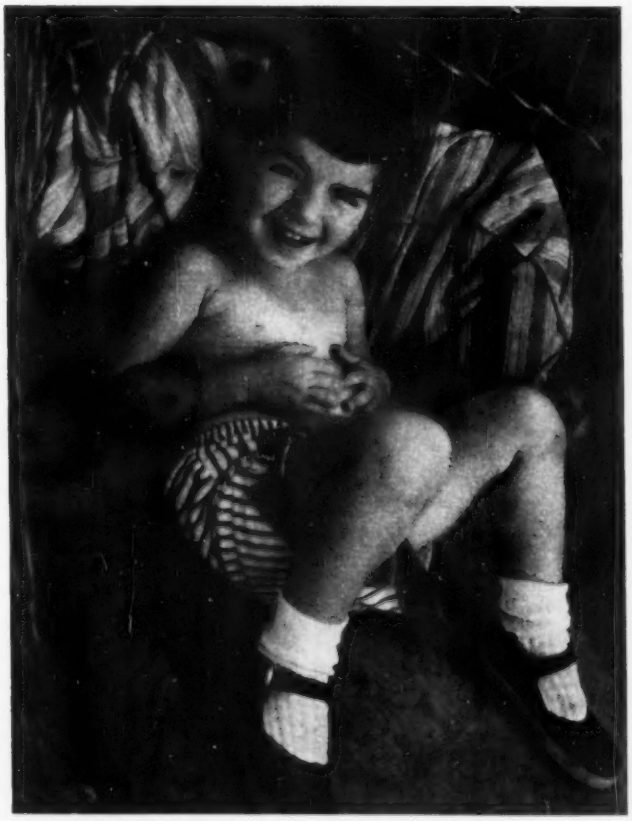
Which of these Polaroid prints is the original?

Nick Dean

Both of these prints were made on PolaPan 200 film. Original is an available-light shot exposed at EI 140; the copy received 7 seconds exposure with camera set at EV 17. Both were developed one minute. Can you tell which is which? (For answer, see page 114.)

Print quality can be improved in copying

Mike Cicerelli



With Polaroid Print Copier it is frequently possible to improve an imperfect original. This available-light shot is too dark, lacks shadow detail.

Improved copy was made by giving extra exposure to lighten shadows, overdeveloping to increase contrast.

I WANT TO KNOW

How can I make close-ups?

Gene Plotnik of New York City writes:

"I want to make pictures of inconspicuous people living in their own private worlds. . . . But for the life of me I can't summon up the nerve to put a camera up in front of someone's face and snap. How do the great candid photographers do it? Do they snap and run? Do they excuse themselves, or do they beg the subject's cooperation? Do they often resort to telephoto lenses or other tricks of concealment? Or are they so presumptuous and egotistical as to aim the camera's prying eye at any and everyone who interests them and let the subject's feelings be damned? . . . How in heaven's name do they get the nerve to take them?" **The editors of Popular Photography reply:**

Stig T. Karlsson

Long-lens close-up was made with a Hasselblad and 250-mm Sonnar lens, exposed 1/100 second at f/5.6 on Tri-X film. His distance from subjects let photographer work with ease and kept them from posing for him.

You can easily find photographers who shoot and run, those who beg or buy the subject's cooperation, and others who use telephoto or long-focus lenses to achieve their ends—namely, candid close-ups. Unfortunately, there *are* some who are so presumptuous or so occupied with their work that they have little regard for the feelings of the people they photograph.

But on the other hand, it's also easy to find great photographers who have tremendous compassion for their subjects and at the same time extreme sensitivity toward their own work. One topnotch photo essayist who went to Hungary to make pictures during the revolt in 1956 became so involved with the plight of the victims that he took no pictures—he spent all his time trying to help the refugees.

A good example of two different approaches was the coverage of the *Andrea Doria* sinking. As the survivors were brought ashore, many photographers ignored the feelings of these shocked victims by shooting off flashbulbs in their faces as they waited on the docks. The pictures made the newspapers and were newsworthy. But probably some of the finest pictures were made by a photographer who used long-focus lenses and worked from a distance, knowing that he could never intrude on the privacy of these people in such a period of stress.

Professional photographers, especially newsmen, become very calloused and accustomed to shooting off flashbulbs in people's faces. In their defense, it must be pointed out that this is their job and their livelihood depends upon their making pictures. When they have to get the picture to keep their job, they get the picture.

But most amateurs are not in this category, so they seldom develop this ability to move in close to their subject without being sen- (*Continued on page* 92)

Jerry Dantzic

Actually getting close permitted the photographer to make this shot with a normal lens. He used a Leica and 50-mm Nikkor *f*/1.4 lens, shooting 1/25 second at *f*/2 on Plus-X. Obviously, the subject was not thinking of the photographer.

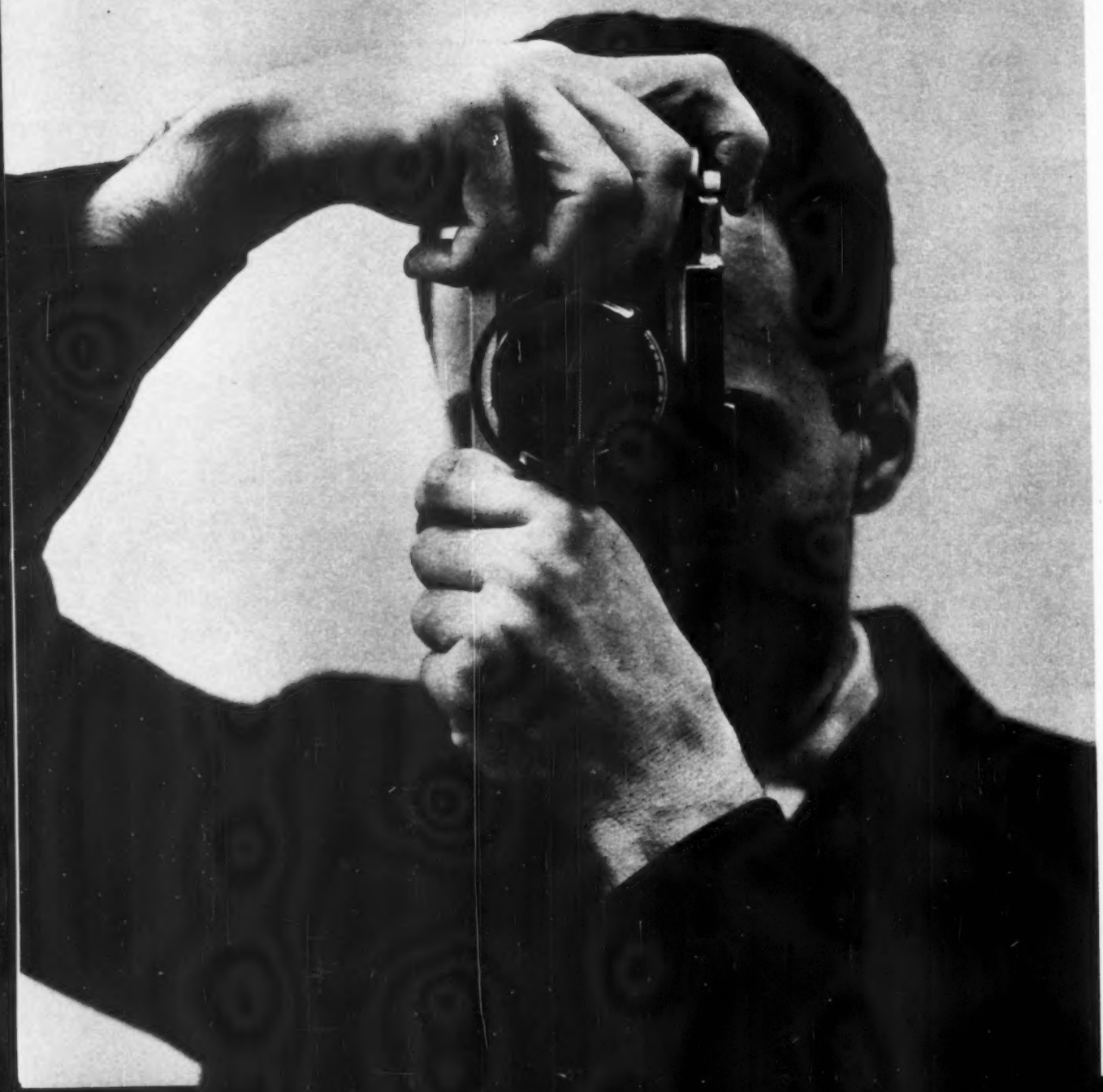
Svante Hedin

By cropping in on a 2¼x2¼ negative, a strong, close-up effect was achieved. It was taken from a reasonable distance with a Meister Korelle and Tessar 80-mm lens. The exposure was 1/100 second at *f*/8 on Ilford HP3 film.

What are my rights?

J. Emmett Cade of Westwood, N. J., asks:

"*How far can an amateur go legally? . . . What are the legal rights of a little fellow with an unobtrusive 35-mm camera as he travels about from place to place, recording what he feels might be interesting, artistic, or exciting? . . . There have been only two or three occasions where I have been thwarted in any serious way: once in a large department store in Canada and once in a legitimate theater in New York State. What are the individual's legal rights in such instances? . . .*"



This reply was prepared from material which appears in Photography and the Law, *a recent book by attorneys George Chernoff and Hershel B. Sarbin. Published by Amphoto, 33 W. 60th St., New York, the book covers in detail the right of privacy and other important legal aspects of photography.*

The editors reply:

A photographer's camera may accompany him almost anywhere he may be—at home, on the street, in the theater, or at a museum. And his right to use that camera wherever he may be is essentially unrestrained. But a few rules restrict the use of cameras, both as to place and subject matter, and every photographer should know them.

It's first very important to distinguish between the right to *take* a picture and the right to *use* that picture, as in publishing it, for example. The use and publication of pictures is a more complex question that is not of immediate concern to most amateurs. The one general limitation that applies to the right to take a picture is that the photographer must not commit a nuisance or interfere with others when taking a picture.

Photographers have a clear right to take pictures on public streets and highways, unless some local ordinance might restrict this right. The chief problem is somewhat the reverse. Sometimes individuals will try by physical assault to prevent a photographer from taking a picture. In such instances, the courts have always upheld the photographer's right to take pictures in a public place. Some years ago, New York state made it unlawful even to injure the apparatus of a news photographer engaged in the pursuit of his occupation in a public place or gathering.

Yet the law is clear that a museum can establish its own rules and regulations for the taking of pictures. Some simply prohibit any use of photographic equipment, while others will not allow flash or tripods. A theater, sports arena, or other place of amusement could also, if it wished, restrict the use of a camera.

Your experiences in the department store and theater were rather unusual. (*In both places Mr. Cade was stopped while making pictures—in the theater he was pulled out of his seat, his film was confiscated, and he was threatened with arrest.*) The owner of private property clearly has a right to make such rules and regulations as he pleases about the taking of pictures on the premises. The photographer must observe them, although he may feel he is being most unobtrusive in taking pictures. But no one has a right to lay hands on the photographer just because he is taking pictures, and any rough treatment would certainly be trespass to the person for which the injured could seek legal remedy.

One field where the amateur may occasionally wander is the courtroom, and picture-taking here is not unrestricted. One of the most controversial subjects affecting photography to come before the courts in recent years has been the application of a rule made by the American Bar Association many years ago restricting the taking of photographs in the courtroom. This rule is known as Canon 35, and its language is harsh and restrictive regarding the taking of photographs or doing anything similar which might create a disturbance.

Press photographers in particular have gone to great lengths to prove that the careful use of a small camera does not create a disturbance. They have demonstrated that they can work virtually unnoticed by anyone in the court, including its officials. Despite the severe criticism of this rule by photographers, the inherent right of a judge to control the conduct of a trial over which he presides is indisputable. So whether anyone, including amateurs, may take pictures in the courtroom depends upon the rules of the particular court.

Most amateurs are also aware that there are limitations on what may be photographed. The most important forbids the photographing of money or securities of the United States. The penal laws of many states also prohibit the photographing of stocks, bonds, and other securities as well as all instruments for the payment of money. Photographs of coins are not prohibited, and under certain circumstances photographs of postage stamps are permitted for philatelic purposes. And naturally, it is always wise to learn if permission is necessary before taking pictures at any military or naval installation.

As you can see, the amateur's right to *take* pictures is not severely limited. But this same freedom does not necessarily apply to his right to *use* those pictures. The use of pictures involves important considerations such as the obtaining of model releases, the rights of privacy, and the possibilities of libel. Any amateur who wishes his pictures published must keep these in mind.

The questions answered in this feature were selected from hundreds asked by our readers. Beginning in the August issue, we'll answer your best questions each month in a new department,

THAT'S A GOOD QUESTION!

What will raise club standards?

Charles E. Frankel, London, England:

"Our camera club has met for the last five years, and we have some talented members. But none of us has ever had any pictures published or gained any outside recognition. If our standards are too low, what can we do to raise them?"

The editors reply:

The problem of "pictorial inbreeding" plagues many camera clubs. Often they begin with high purposes and wind up as merely social gatherings where good friends may comfort and compliment each other's picture-taking efforts.

This frequently happens because old members teach new members. Then they judge and criticize each other's pictures. If an outsider doesn't agree with their judgments, they say he doesn't understand photography and what they are trying to do. When members are content to wander this way, avoiding what they might consider unfriendly crit cism, it isn't long before people start leaving the club, often because of boredom.

Usually a small nucleus arranges the showings, handles the committee assignments, collects the dues, and plans the outings. The ideas of this small core of leadership determine the role of the club. If these ideas are not a source of inspiration to new members, the newcomers will not make contributions to the club commensurate with their potential.

Obviously not all club members are serious amateur photographers. Many will join solely for the cameraderie of the group. They will respond to criticism, guidance, and instruction, but too much of it will drive them away. They must first be inspired to seek this photographic self-improvement.

A balance must be found between sound criticism that shows these amateurs how they may improve and inspirational guidance to make them want to improve. Obviously the best criticism is likely to come from persons outside the club, who can be more objective. Professionals in the field are a good choice for this.

Why are my 35-mm pictures grainy?

Ted Clemens, Mt. Kisco, N. Y.

"Four out of five times my 35-mm pictures blow up grainy. What do I do wrong? Every time I get prints back from the drugstore, they're so grainy that I never want to use the camera again. Does this always happen with small negatives?"

The editors reply:

Excess grain is not usually the result of trying to blow up small negatives. Probably the chief cause of excess grain in your prints is overexposure of your negatives.

Like most people, you have followed the manufacturer's film rating speed and suggested shutter speeds and lens openings. If you have done this faithfully, your pictures are probably overexposed. Manufacturers rate their films on the conservative side so that amateurs are more certain to get an image.

Therefore, it's best to at least double the ASA rating assigned by the manufacturer to any black-and-white film. If you don't use a meter, shoot your film twice as fast as instructed or increase your *f*-stop by one. The quality of your negatives will improve significantly.

Avoid taking pictures where the light is so weak that your film development must be forced to produce an image. Forced development can cause severe grain problems, especially when not handled by someone expert in film processing.

Also consider the type of film you're using. The faster the film, the coarser the grain. High-speed films should not be used in bright sunlight when the speed is not needed. For most light conditions (and with the manufacturer's rating doubled) the slower films will serve you well and give much less grain. And with these slower films, you are less likely to overexpose.

Another way to get better results is to use more care in selecting a processor for your films. Most drugstores use a processing service which is usually a mass-production operation. You get 24-hour service and low prices, but you must not expect the quality of your prints to be the same as those done by a processing firm which takes more time for custom work.

By doing your own processing and printing, you can learn much about your camera and your picture-taking ability But if you want to have your film processed by someone else, keep in mind that the cheapest and fastest service is not usually the best for good pictures.

As in almost any other area, you get what you pay for. Slightly higher processing costs and a little longer waiting can bring you vastly improved pictures.

How can you get glossy prints?

W. E. Miller, Toledo, Ohio:

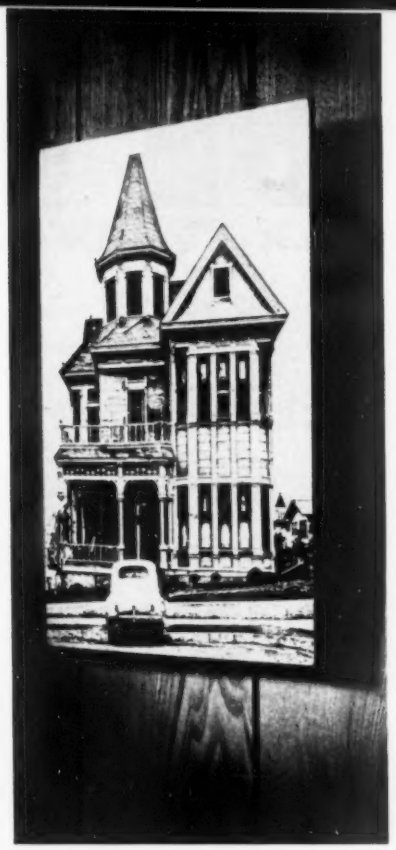
"I believe that a discussion on ferrotyping would be timely. I have found it to be extremely difficult to produce completely satisfactory glossy prints on ferrotype plates, dull spots being the main problem. Quite likely others have the same problem."

The editors reply:

The possible pitfalls in getting good glossy prints are numerous. Getting the proper combination of paper, hypo, washing time, ferrotyping solution, and wax for the ferrotyping surface almost seems to require a long period of trial-and-error seeking.

Probably the chief cause of unsatisfactory glossy prints is the simple failure to keep the ferrotyping plates or drum sufficiently clean. Water spots, dirt, and grease will give pocked and spotted surfaces to prints. Ferrotyping plates or drums should be waxed to insure the best possible glossy surfaces.

But your difficulties may lie elsewhere.



Paper that's too old does not take ferrotyping well. Washing prints too long or too little is another fault. The wrong amount of hardener in the fixing bath will make it difficult to ferrotype. The many prepared ferrotyping solutions are usually worth a trial if you're having troubles.

Another point is this: why do you want your prints ferrotyped? The old belief was that none of the matte and semi-matte surface papers could compare with the glossies for richness of the black and purity of the whites. But in fact, some of the newer nonglossy surface papers have a much richer range of tones than most glossy papers.

Photographers who make display prints want people to see them under the best possible conditions. And they do not want viewers to miss any details because of reflections caused by a glossy surface. So most prefer a surface that gives off as little gloss as possible (like the photo, left) and yet provides them the deepest range of tones. Therefore whether to gloss or not is a consideration that should occupy the serious photographer.

Is there a secret to winning contests?

William Collins, Davenport, Iowa:

"Why is it that when you look at photo contest winners you keep seeing the same names all the time? I've entered a lot of contests, but never won anything. And I don't think my pictures were so much worse than those that won prizes. Is there some secret to winning picture contests?"

The editors reply:

The secret, if any, to winning photo contests, or any other type for that matter, is to make a thorough and critical study of the contest and to determine what the judges will be looking for. Entering a print in a contest simply because you like it more than any other is the wrong thing to do.

One photographer who has won top prizes in the great majority of the national photo contests which she has entered says that prize-winning pictures must always be psychologically and emotionally related to the sponsor's objectives. For example, if the contest is for children's pictures and is sponsored by a family magazine, shots of healthy, happy children are more likely to win than offbeat ones which portray children in tragic or unusual moods.

The point is that the contest entrant should study the publication or the group sponsoring the contest and decide what would please them — not what would please him to have win. A thorough study can be extremely valuable and help the contestant select from his files or go out to take the picture that will give him the greatest possibility of winning a top prize.

Unfortunately, too many amateurs neglect just the simple rules and practices that will insure the maximum consideration of their pictures. They fail to submit the best possible print of their picture. They neglect to send in several prints when this is permitted. They forget to make their print as large as the contest rules permit, forgetting that few judges can help but be relieved when they see a well-mounted, large print in a pile of snapshots. They title their pictures, and when the words don't click with the judges, the effect of their picture is hurt. And last, they package their entry in such a way that it becomes damaged in mailing and handling.

Successful contestants keep these factors in mind when they submit entries, and it's the reason their pictures keep winning. Once they win a contest, they begin to see how it's done and they get the successful formula which usually is very simple. They also go out of their way to make pictures, for they're not always content to try to find something in their files which would be merely suitable for sending in. But perhaps the most important reason many of these people are continually successful is that they take good pictures.

A GUIDE TO OUT

Here's a check-list of basic techniques to help you achieve

USE YOUR EXPOSURE METER PROPERLY

Reflected-light meter

Don't point meter at sky; result will be too high a reading and an underexposed negative. Also, be careful not to accidentally cover up part of photoelectric cell with your hand.

Do hold meter at a 45-degree angle from ground for a more accurate over-all reading of a scene. Beware of changing light conditions, and take a new reading if sun goes behind a cloud.

Better yet, take a close-up reading of darkest and lightest areas of the subject, choose a compromise exposure about midway between the two. Camera with built-in meter used here.

For a distant subject, when you can't get close for a direct reading, take a close-up reading from your hand (held to catch light from sky) and use that as a guide to proper exposure.

DOOR EXPOSURE

perfectly exposed negatives when shooting pictures this summer

Incident-light meter

Photos by PETER GOWLAND

With incident-light type of meter (which measures intensity of light falling on scene), take your reading from subject position with light-collecting cell pointed towards the camera.

When shooting a distant or unapproachable subject, hold incident-light meter parallel to the subject plane facing camera, be sure similar type of light is falling on meter and subject.

IN SPITE of the prevalence of inexpensive exposure meters, wide-latitude films, and reliable cameras, exposure errors continue to be the most common cause of picture failures. Don't you be among this summer's crop of disappointed picture-makers because you ignored or forgot a few basic rules about exposure. The pointers given on these four pages will help you score a high percentage of successes in most outdoor lighting situations.

First problem is film. Unless you're shooting on a dark overcast day, or in deep shade, avoid using a high-speed emulsion. Medium-speed films offer ample speed for most outdoor picture-taking situations, have finer grain, wider latitude, better gradation of tones than ultrafast emulsions. For maximum quality, use a thin-emulsion film—but be meticulous about exposure. Thin-emulsion films allow less margin for error than do most medium-speed films.

You can get by without an exposure meter if you follow the manufacturer's instructions, modified by your own experience. But to insure consistently good results under all conditions, there is no substitute for a photoelectric exposure meter—properly handled and intelligently interpreted. Basic meter technique, both for incident- and reflected-light types, is demonstrated at left. When using a camera with a built-in meter, of which there is an ever-increasing number, remember to handle the camera itself as if it were a meter. In other words, don't rely on readings made while the camera is held in *shooting* position, but move it close to the subject for comparative readings of shadow and highlight areas.

The problem of lighting contrast—both too little and too much—is covered on the following pages. Outdoors in summer, excess contrast is more likely to be the problem. Exposure and development controls can help to a degree, but if the lighting is very contrasty then proper use of an exposure meter becomes especially important. Take a reading of the darkest shadow areas and the brightest highlights. For the widest possible coverage use a compromise exposure—slightly on the highlight side of a mid-point between the two extreme readings. Of course, for special effects (demonstrated on following spread) you may want to base your exposure on either the shadows or the highlights and allow the other end of the brightness scale to register as it will.

HOW EXPOSURE HELPS OR HINDERS FILTERING

Slight underexposure (one stop here) tends to enhance effect of filter. Both pictures above were taken with medium-yellow filter and medium-speed film. Meter-indicated exposure: 1/100 sec at *f*/11.

Overexposure (two stops here) tends to cancel out filtering effect. Notice the paler sky tones and the washed-out clouds. Therefore, when using a filter, be especially careful to avoid overexposure.

HOW TO INCREASE CONTRAST

The soft light of open shade (or on an overcast day) sometimes produces pictures which are too "flat"—lacking in contrast and sparkle. This open-shade portrait was exposed for 1/100 sec at *f*/5.6.

Decreasing exposure by one stop and increasing development by one-third increases contrast. Basic rule: exposure has proportionately greater effect on the shadows, development on highlight areas.

HOW TO REDUCE CONTRAST

Highly contrasty lighting creates bright highlights and dark shadows. Film is unable to compress such a wide range of brightness into its limited scale of tones. Result: loss of highlight, shadow detail.

Increasing exposure by one stop (from meter-indicated 1/250 second at *f*/11 to 1/250 at *f*/8) and cutting development time by one-third, reduces over-all contrast and produces a more printable negative.

EXPOSING FOR SPECIAL EFFECTS

Exposure for this backlighted portrait was based on shadow area of the face, and the sunlit background was allowed to "block up" —an example of selective exposure for one end of brightness scale.

Silhouette effect is created by the opposite tack—basing exposure on the bright areas of the picture and letting shadows go dark. Note how Gowland hid the sun by catching ball at exactly the right instant.

ARE WOMEN

MENTION "photography" to a woman and she immediately thinks of complicated dials, involved mathematics, and the mysterious world of science.

Yes, most women are allergic to photography, and the camera for them is a booby trap that cuts off heads and creates unbelievable pictures.

Next time you go into a photographic store, look around at the customers. The majority are men. And who's in the majority when it comes to photographic shows and exhibits? As usual it's the male.

Even photographic manufacturers seem convinced that women don't care to mix with photography. Their ads seem to be aimed at men.

Think back to your vacation. The only women who carried cameras were those who traveled alone. They were forced to take a camera along.

Think a minute about the average family, your family. The camera gets tucked away during the week and comes out only on the weekend when Dad is home.

If you're not convinced of women's photographic inferiority complex, leaf through the pages of the family album. You will find one person always present in the snapshots. Who? The lady of the clan. The man is the photographer of the family.

Most women react to photography just as they react to driving an automobile. They'll gladly push the buttons and drive a car but leave the technical matters to a man. They'll never object to pushing the shutter release on a camera if it's loaded and set. However, in both cases, if the machine doesn't perform, they call a man for help.

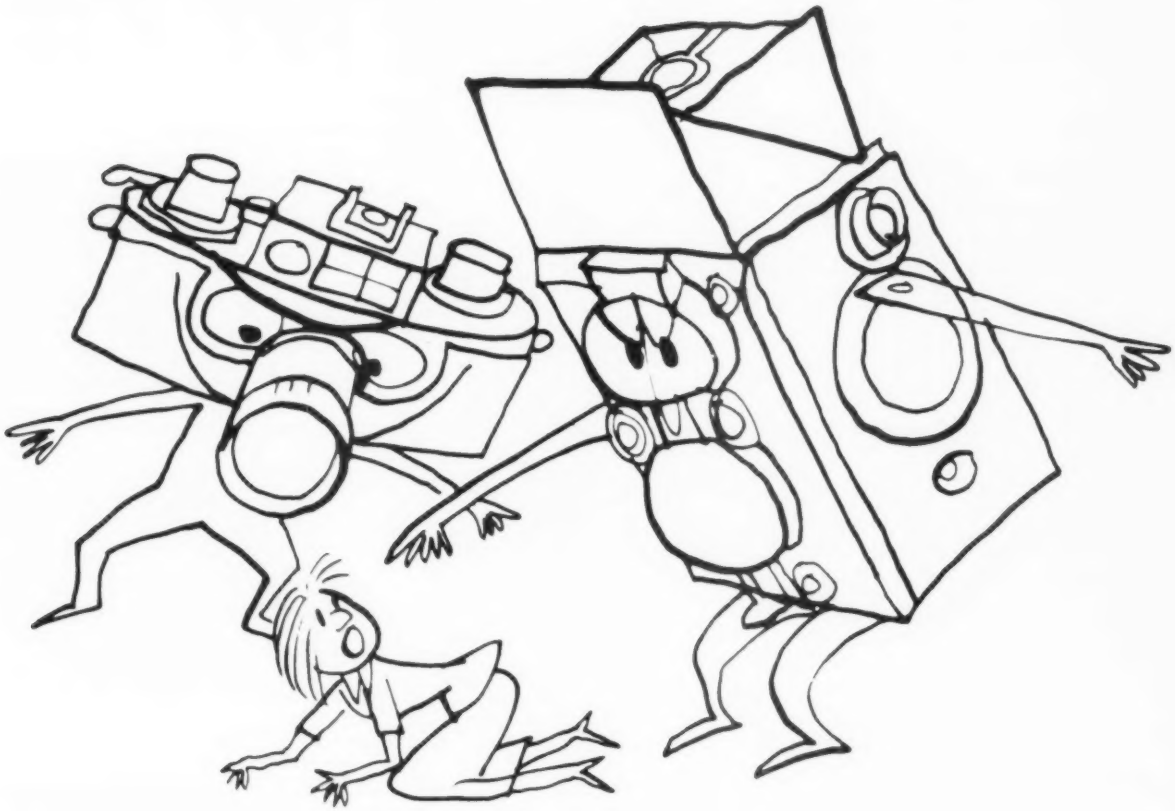
Why don't women take pictures? Here are some reasons:

1. Husbands, boy friends, and fathers have been the controllers of photographic equipment, just as women have controlled the pots and pans.
2. They are afraid to make mistakes.
3. Sheer laziness.
4. Ego! They like to be in front of the camera instead of behind it.
5. There's always been a man (*Continued on page* 117)

By RITA CUMMINGS
Illustrations By JOHN SENERES

ALLERGIC TO PHOTOGRAPHY?

DO THEY SHRINK FROM PICTURE TAKING? DODGE THE DARKROOM? HERE'S ONE FEMALE'S APPRAISAL



HOW TO

USE PRINTING-OUT PAPER

1

For a quick set of contact prints you don't need to set up all your darkroom equipment. Instead, use printing-out paper, like Kodak's Portrait Proof. The minute your negatives are dry you can place them on a sheet of printing-out paper (emulsion to emulsion), lay a sheet of glass over both, and then expose by sunlight or tungsten light. When the paper turns to a deep red-violet at the edges, your contact sheets are ready.

CARRY TWO CAMERAS

2

Two cameras are faster than one! For real versatility and convenience have two on hand when you shoot. You'll not only save reloading time with two cameras, but, if there are different lenses on the cameras or you have color film in one and black-and-white in the other, you'll be prepared for any situation. The time you save by not having to grope in your gadget bag for lenses or film can be very important shooting time.

USE BRIGHTER ENLARGING BULB

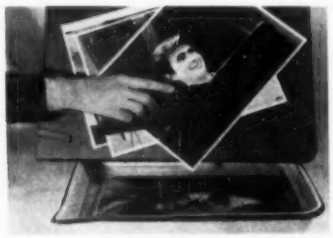
3

Are your printing exposure times too long? If they run much more then ten to twenty seconds—with the lens properly stopped down—replace your enlarger bulb with a brighter lamp of the same size. The most common enlarger lamp is the No. 211. Stepping up to a No. 212 cuts exposure time in half. A No. 213 will halve this again. A 213's only drawback is its average life of only three hours, but it's sometimes worth it.

REMOVE EXCESS WATER FROM PRINTS

4

You can cut drying time greatly by sponging off excess water before you put your prints in the dryer. You'll get better looking, spotless prints this way too. You might use a squeegee, a towel, a sponge, or even a blotter, but make sure that whatever you use is *clean*—that goes for the surface you have your prints on too. Remember it's best to work from the middle of the print towards the edge so you won't wrinkle the print or chance peeling the emulsion.



USE RAPID FOCUSING TECHNIQUES

5

You'll save time where it counts if you use these three tips for rapid focusing. *First*, practice focusing so that you can do it quickly and accurately when you're actually shooting. *Second*, know the point where the crucial action will take place and prefocus on that spot so there will be no lost time when the action occurs. *Third*, focus on the lightest and most clearly defined part of the subject, like a collar or a person's eye.

Here are 10 shortcuts that can add extra minutes to your picture-taking hours

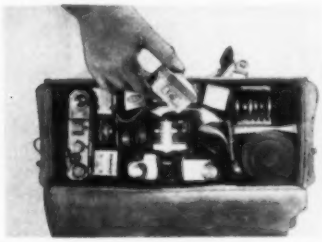
SAVE TIME

6 REMOVE DUST FROM NEGATIVES

Every spot, speck, or hair left on the negative you're enlarging means time wasted in tedious print spotting. Dust your negatives *carefully* before putting them in the enlarger. You can remove dust with an anti-static brush, a special blower, or by using anti-static solution or spray. And don't forget, a thin coating of vaseline is a fine scratch-filling agent.

7 BUY FILM AHEAD OF TIME

If avoiding a trip to the camera store every time you shoot isn't reason enough to buy in bulk, remember how much cheaper it is that way. Be sure you always have an ample amount of film on hand—plenty of color and black-and-white in a variety of emulsions. It's just common sense to save time this way, and you're ready to shoot anytime.

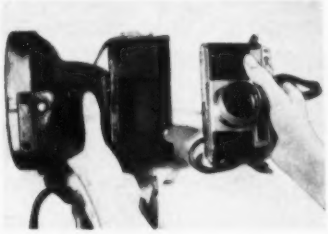


8 KEEP GADGET BAG LOADED

How many times have you found yourself running to the nearest drug store for film while a picture was waiting to be taken? A great deal of time and energy can be saved if you look ahead and bring enough film. Pack your bag with everything you might conceivably need; keep it neat and orderly too so there will be no fumbling when the picture opportunity is on hand. Your bag should also be kept loaded and ready to go at a moment's notice.

9 PLAN YOUR SHOOTING

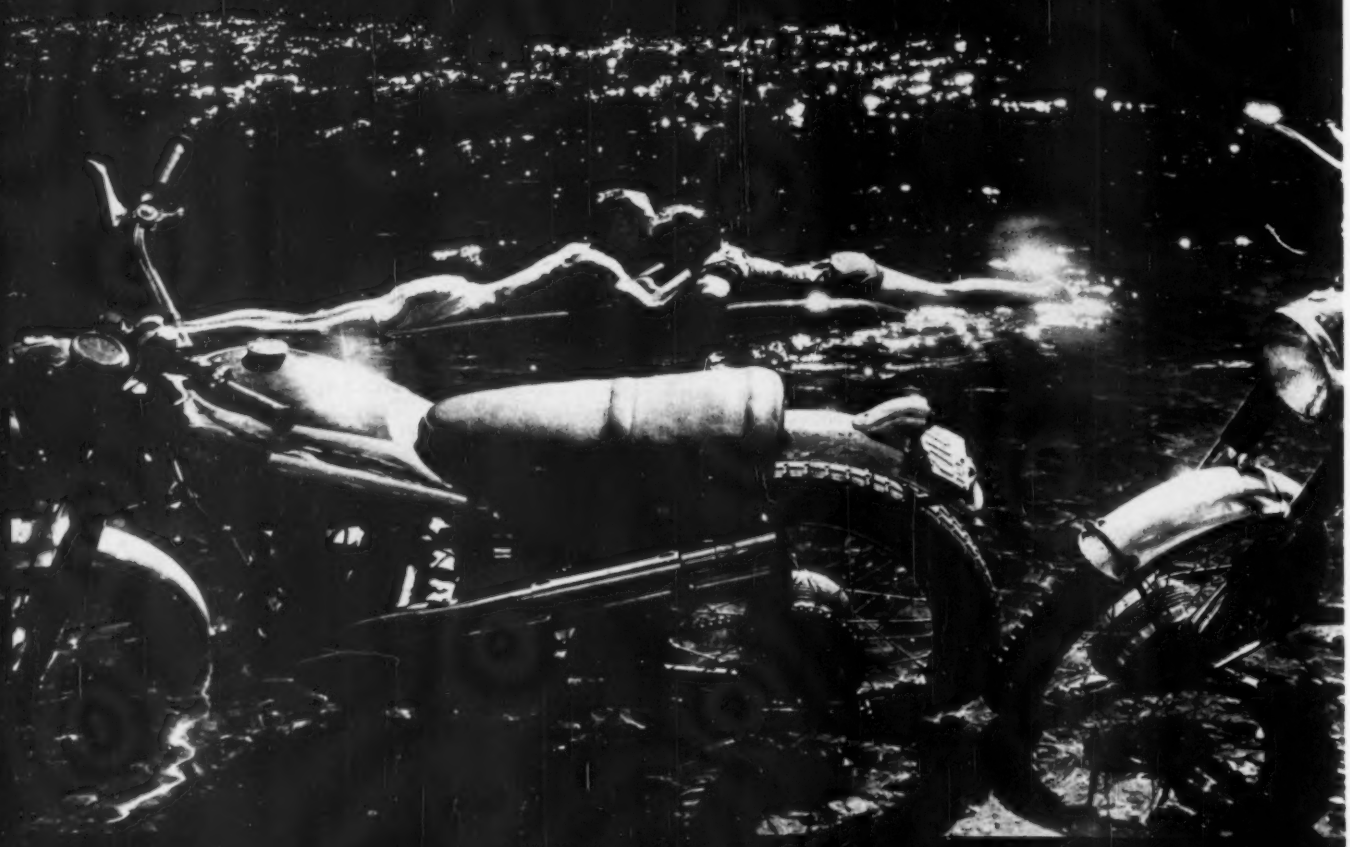
Know what you want before you go out to shoot. Sit down and write a "script." Decide not only what you want but also what aspect of your subject you want to emphasize. When you get to your location, don't be afraid to shoot an extra roll—the price of film is often less than that of a return trip and certainly less time consuming. Thinking is 90 percent of a good picture.



10 TAKE YOUR CAMERA CASE OFF

Most pros find that a camera case is a nuisance when they're on an assignment. The time it takes to unsnap a case can mean the difference between a good or mediocre shot, and a camera case dangling can be very distracting. A simple strap (the best kind snap apart quickly) gives you and your camera more freedom; your camera is unhindered and ready to go.

PICTURES



Cyclists' cool-off in California's Kern River gave Richard R. Hewett this sparkling summer shot. To keep the snapping highlights, he made the print on the contrastiest grade of paper. The picture itself was made with a Rolleicord, on Super-XX film, at 1/50 second, f/11.

Extreme contrast was used here too, by Nobuo Tabata of Osaka, Japan, but he got the effect by copying a color transparency three times on high-contrast black-and-white film. Original was shot with a Rolleiflex and Fujicolor film, and exposure of 1/50 second at f/6.3.

←

UTTER RELAXATION *is expressed in Jeanloup Sieff's humorous picture, made on the Greek island of Corfu, where he was shooting a fashion assignment. He photographed his spread-eagled friend with a Leica IIIf which had a 35-mm Canon f/1.8 lens, at 1/100 second, f/5.6, on Tri-X film.*

→

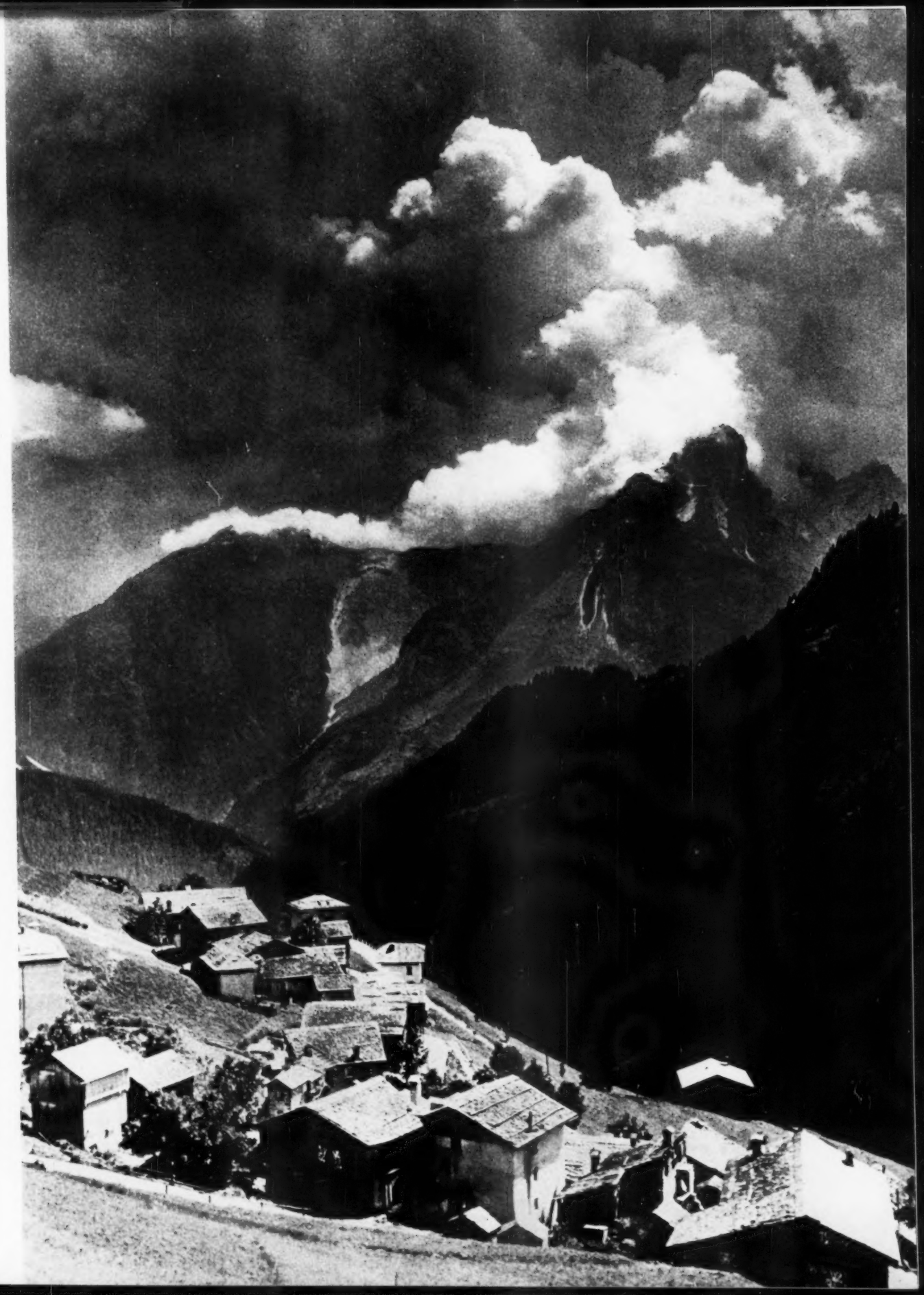
LONESOME BIRD *perched on a beach trash basket was isolated by overexposure and selective focus by Jesse A. Fernandez at Rockaway, N. Y. He used a Leica M-3 fitted with a 200-mm long-focus lens and Visoflex bellows, and shot at 1/50 second, f/5.6 on a hazy summer afternoon.*

BLANKET TOSSING *shot was part of a continuing documentation of Coney Island by Harold Feinstein. With medium-fast shutter speed he stopped much of the motion without "freezing" it. He used a Canon Vt with normal 50-mm Canon f/1.2 lens, and exposed at 1/200 second, f/8, on Plus-X.*

OVERLOOKING *an Italian Alpine village, Elio Ciol got a magnificent land- and skyscape, using a red filter to strengthen the clouds, drawing them into the same plane as the mountains. He used a Rolleicord and Gevapan 30 film, and exposed at 1/30 second, f/5.6. The filter darkened shadows on hillside, lightened foreground highlights.*

BLEECKER STREET, *one of New York's Italian markets, was subject of a picture story by Y. Ernest Satow, for which this was the key shot. He made it from a high angle with Leica M-3, on Panatomic-X, with an exposure of 1/30 second at f/8.*

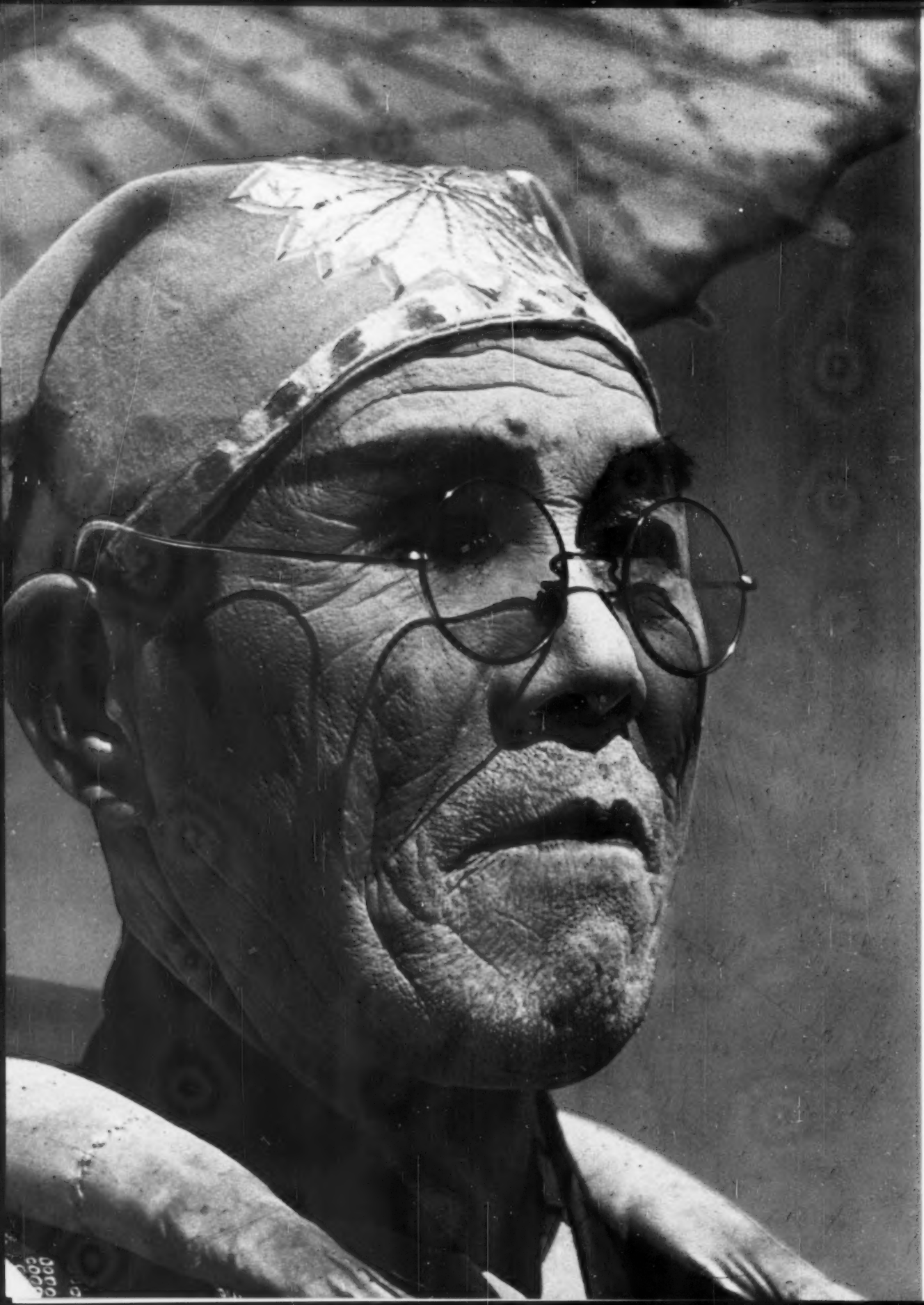
BUSMAN'S HOLIDAY: *John Gorman, San Francisco news photographer, got this shot of his daughter Nancy on returning from an assignment. He used a Super Ikonta B with 80-mm Tessar f/2.6 lens, Super-XX, and slow shutter, 1/25 at f/8.*

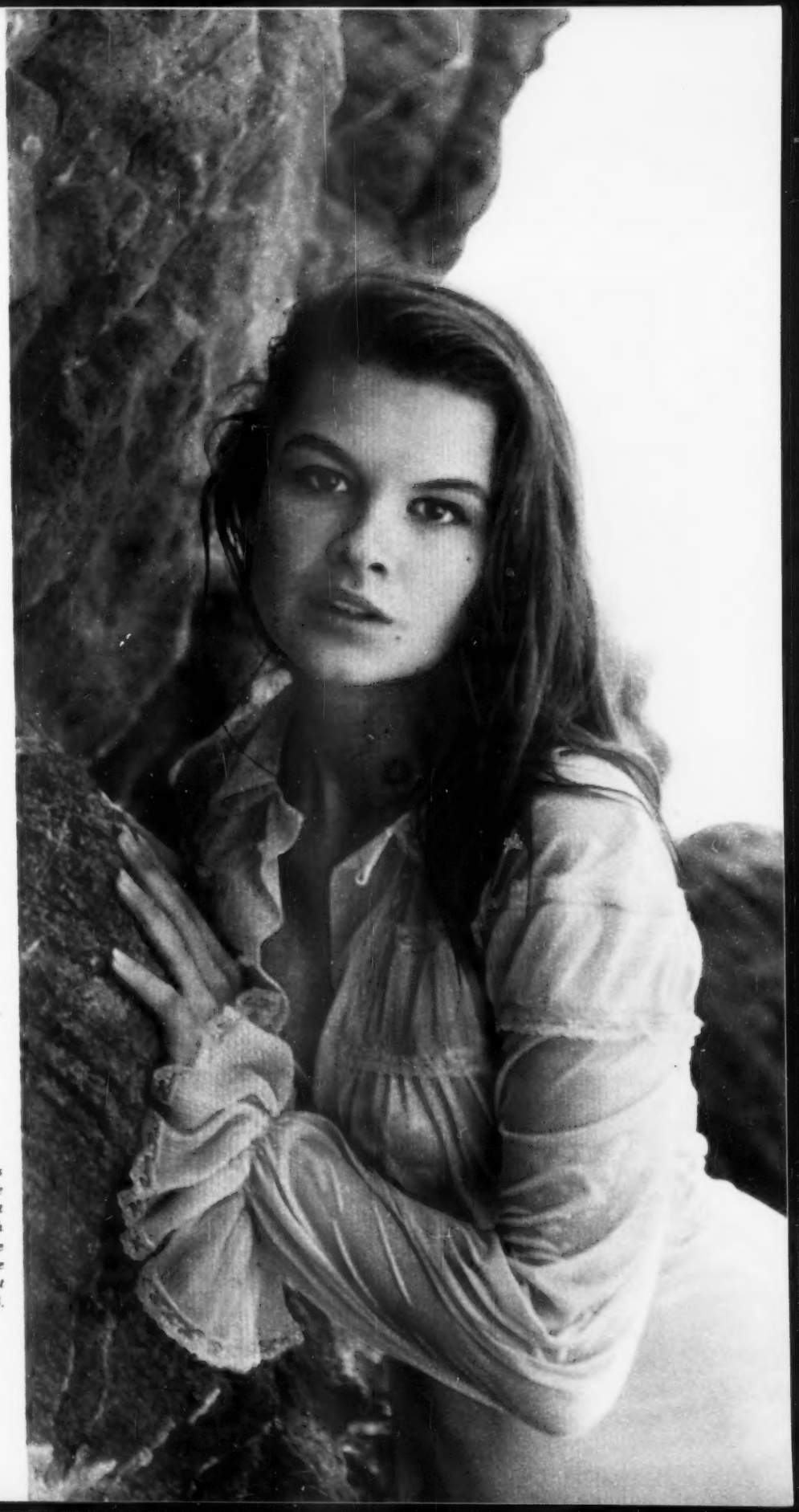


SENSITIVE PORTRAIT *of a young girl at a window is the work of E. B. Henderson, an advertising art supervisor. A wide aperture enabled him to include the figures framed in the doorway without making them sharp. He used Leica, 90-mm Elmar f/4, Tri-X, and his exposure was 1/50 at f/4.*

→

IN A CITY GARDEN, *Al Francekevich made this close-up of black-eyed Susans, using a Consol single-lens reflex camera with 58-mm Biotar f/2 lens. At maximum aperture, shallow depth of field enabled him to get just one flower sharp. He used Kodachrome, exposed at 1/50 second, f/2.*





JAPANESE *sandwich-man, announcing wares of local merchants in Yokosuka, attracted the attention of Navy Lieutenant Bob Gomel. He made the crisp, colorful shot with a Miranda and 105-mm f/2.8 lens. Film was Kodachrome, and exposure under direct sunlight was 1/125 second at f/4.*

PRETTY ACTRESS *Susan Harrison was photographed against the rocks of the California coast. Glamor specialist Peter Basch used a Leica M-3 with 50-mm Sonnar f/3.5 lens to make the picture, on Kodachrome Daylight Type film. Exposure, under an overcast sky, was 1/25 second at f/4.*

AMATEUR'S

*LET'S

1 *Robert L. Parks*

2 *Merton Gordon*

3 *Yook O. Hom*

WORKSHOP

TALK ABOUT YOUR PICTURES

Each month the editors of POPULAR PHOTOGRAPHY *will discuss pictures submitted by readers. We will pay $15 for each black-and-white and $25 for each color picture published. Only color will be returned. Complete technical data must accompany all prints.*

1 Robert L. Parks, Sandusky, Mich. The editors agreed that this was an appealing picture, helped greatly by the shy smile on the face of the child (the photographer's son). The subtle color relationship between background, hair, and blanket also added. But a minority felt that the flat lighting and seemingly self-conscious pose made the picture less creative than it might have been. Aires III with 45-mm H-Coral f/1.9 lens, exposed 1/25 second at f/1.9 on Anscochrome Tungsten Type. Window light was main source plus fill-in from reading lamp.

2 Merton Gordon, Syracuse, N. Y. This provocative and off-beat nude study was well received by all the editors, who liked the pastel colors against the monochromatic sky. Most considered the pose stylized and self-conscious but sufficiently graceful to provide a good design element. A little more of the model's face might have lent more animation, but in general the photographer captured the exuberance of a summer day. Rolleiflex with 75-mm Schneider Xenar f/3.5 lens, exposure 1/50 second at f/8 on Ektachrome. A No. 25 clear flashbulb was used as fill-light.

3 Yook O. Hom, Brooklyn, N. Y. The majority was taken by this striking, almost monochromatic goldfish picture. They liked the effective use of a high angle and close-up technique to create an almost symmetrical design of fish and bowl. But one editor thought the tones of orange and yellow too close, while another felt the subject was almost lost in the eye-catching background. Exakta VX with 58-mm Biotar f/2 and portrait close-up lens. Exposed 1/50 at f/5.6 on Kodachrome in late afternoon daylight with small mirror for reflector fill-in.

4 *Cesare Albani*

4 Cesare Albani, Milan, Italy. This one touched off a discussion on composition, with the majority agreeing that the photographer handled the rope, boat, chain, and water well in making his design. Strong, sharp-contrast printing also underlined the feeling of form. But two editors dissented, one of them calling the picture "unspeakably dull," feeling that it depended entirely upon the composition for its interest. Retina II with exposure 1/25 second at f/5.6 on Pantura film in early morning light.

*WHAT YOU SHOULD KNOW ABOUT

BOX CAMERAS

by Robert L. McIntyre

SOMEWHERE in the past of almost every fan lies an old, reliable box camera. He thinks back to the fine pictures he got with it before he knew much about photography, and at times he may even rue the day he gave it up for a better outfit. The box camera is still a trustworthy tool for picture-taking. As long as you limit your photography to shooting motionless subjects on sunny days, it will give you good results every time. You don't have to worry about focusing or setting lens and shutter. Everything's pre-set so all you have to do is aim, hold steady, and press the button.

No matter how elaborate a camera you now use, you can make it as easy to handle as the old box camera. The secret of recapturing its simplicity is simply to adjust lens and shutter to match the common box camera settings. Once this is done, you don't have to think about exposure. As long as you shoot only when the sun is bright, you need only check the aperture, shutter speed and focus settings to make sure they haven't been moved by accident.

For taking pictures with medium-speed, snapshot-type black-and-white film you can stick to one basic exposure. Set the shutter at 1/100 second and the lens at f/11. That's faster than your old box camera clicked, but today's amateur films are faster too, and have more latitude. This exposure will cover almost any fair-weather picture situation. Focusing is just as simple. For a camera that takes 2¼x2¼ or 2¼x3¼ pictures, set the scale at 20 feet. Everything will be acceptably sharp from 10 feet to infinity. With the standard 50-mm focal length lens of a 35-mm camera, you can focus at 15 feet and get everything from 7 feet to infinity acceptably sharp.

Color films require greater exposure. A good setting for Kodachrome, for example, is 1/50 sec with lens at f/6.3 (halfway between 5.6 and 8 on the aperture scale). With a 35-mm camera this calls for focusing at 25 feet, which makes everything from 12 feet to infinity come out sharp. You can work out the box camera setting for any camera-and-film combination. You'll find basic outdoor exposure recommendations in the film manufacturer's instruction sheet—or you may have a preference based on your own experience. A depth-of-field table for your lens will help you find the best focus setting. Select the shortest distance that still will leave infinity within the zone of sharpness. The system works for indoor flash photography too. Here you standardize on a particular combination of film and flashbulb and an average distance, then select camera settings accordingly.

A few cameras are designed with these simple settings in mind. Their lenses, shutters, and focusing scales are marked where they should be set for simple operation under average conditions. You can make yours as easy to use by marking the settings you choose with small dots of bright red nail polish.

For the conditions under which the vast majority of pictures are taken, these settings automatically cover the mechanics of photography. They leave you free to think about what you want to shoot—to concentrate on framing the best possible picture in your finder before you trip the shutter. The pre-set camera is always ready to catch those unexpected photographic opportunities that pop up in a moment and are gone almost as quickly as they come.

They're fine for camera borrowers, too. If there is somebody in your family you would like to see taking more pictures, somebody who can't seem to master the complexities of your advanced outfit, you can turn it into a box camera again by marking these important settings. The system provides box camera simplicity when you want it, yet leaves all the flexibility you need for those occasions when you really require it.—

*MAURICE BAUMAN

I WASN'T even a snapshot enthusiast until a chance encounter in 1935 with an old friend, Eliot Elisofon. He and I had grown up together in lower Manhattan. He told me of his basement studio-darkroom and insisted on showing me his pictures. I went along to oblige him, but when he displayed some 16x20 exhibition enlargements I was impressed. If this is photography, I might be interested, I thought.

My interest grew avid soon after I purchased a Contax, my first camera, and probably the first model marketed by the company. The idea of creating huge blow-ups from small 35-mm film was exciting. This was about 23 years ago. Today I use 35-mm cameras for some of my professional work, and I still think it's exciting.

Photography became my hobby when I was a pre-medical student at Lehigh University. Science was my major interest, but the depression ended my medical studies. With the acquisition of a 4x5 Corona camera I did what comes naturally—I took portraits of my relatives for pay.

This led to a business venture which I still find incredible. Three of us—a friend, a fraternity brother, and myself—opened a studio. We soon learned that the jobs which paid were magazine and advertising photographs, but one of my partners was more interested in photojournalism, and the other in selling. I usually did the commercial assignments.

Mademoiselle ran a merchandise column called "Just Looking." The price for each photograph was $5, and we were delighted at the chance to make this kind of money, even

*WEEKEND ASSIGNMENT

JULY 4 *The big weekend starts on Friday with Independence Day celebrations, so make the most of it with your camera. Almost anywhere you go, you'll find vivid fireworks displays to photograph. Put your camera on a tripod and let the blazing lights of the rockets and pinwheels trace a pattern on your film. Experiment also with the new high-speed color films, and see what fireworks spectacular you come up with.*

JULY 12 *All of July is Picnic Month, so range through the picnic grounds with your lens for a picture essay on that great summertime institution. Look for strong, human interest close-ups as people really relax and enjoy both food and recreation. For an off-beat essay, try to tell your story entirely in abstract still-life pictures. Consider making a color slide show that will bring back happy memories in the cold winter months.*

JULY 19 *Imagine you've been asked to take a calendar picture for the month, and you have to put all your feelings and ideas into just one picture. What will it be? The barefoot boy walking down the dusty road with his fishing pole has been done to death, so look for something different that will instantly say "summer and July" to anyone seeing it.*

JULY 26 *It's National Hot Dog Month, but in most communities it's also a time when most dogs (canines, that is) are very warm. Did you ever notice how animals, just like humans, do their best to escape the summer heat? Do a picture story on how your dog, cat, or any other favorite pet reacts to the sultry weather. Work up a humorous story that you might be able to sell to your local newspaper.*

—I WAS AN AMATEUR as told to Mildred Stagg

though I photographed every product 18 different ways just for the exercise.

We had a department store account too, and once all three of us were dispatched to the last stop on the Brooklyn subway system. The rug we had been sent to photograph required three men to lift, but we had no trouble carrying the pay—$3 for the job or a neat $1 apiece. Remember that in those days a subway ride cost only 5 cents.

By 1939 we had a large commercial operation going. One partner left to join *Life*, and I kept up the studio with a force of photographers and assistants. However, when the draft came it blew through my studio and left me without help. While waiting around to enter the service I bought a small, one-man studio. Then Macy's decided to set up its own studio and invited me to start it. This job lasted six or seven months. Again I returned to my business with a new partner.

By this time I was no longer really commercial-minded. Color had become dominant and also tremendously complicated. Because of my scientific training, I began manipulating color film and prints in ways that the manufacturers did not prescribe. This led to a certain amount of preoccupation with intricate technical solutions for creative compositions.

While many of my illustrations were extremely difficult technically, others were simple. One photograph that I made for RCA cleaned out J. G. Saltzman's entire stock of electronic flash and required a 12x20 camera for the job.

Another was an equally effective illustration of a New York scene designed to suggest the hustle and bustle of a busy thoroughfare. All I needed to create this effect was to find the proper vantage point and use the slow *speed* that would indicate motion on the color film I was using.

It has always interested me to turn from one type of illustration to another diametrically opposed. Of two of my photographs that have been particularly well received, one was a still-life of groceries in a paper bag with a loaf of Levy's rye bread featured. The other was a glamor ad for Saks Fifth Ave. The bread was shot in such a way that it gave a three-dimensional effect with the focus as sharp as the keenest lens and small aperture could make it. For the fashion photograph an appropriately soft effect was required with exact focus only on the featured merchandise.

Food and fashions may appear to be an incongruous combination, but I find both equally challenging. Finding ways to photograph food so it will look appetizing and yet have a novel and distinctive effect is an assignment that requires technical skill plus a degree of imagination and artistry. The esthetics learned from working with high fashion and glamor carry over to the composition of objects that may not in themselves be photogenic but must be made to appear so through an illusion created by the photographer.

The trend today to small cameras for illustration is one that I applaud but it does not mean that a photographer should turn professional without any technical knowledge. Even on a comparatively simple assignment a situation may arise that demands experience with a variety of films and lenses as well as with the results that certain combinations of films, lens, and processing can produce in an emergency.

The new developments in film have made the transition from amateur to professional a step rather than a jump. For me they changed a recent industrial assignment from a production to a breeze. Instead of packing my usual truckload of electronic flash, power packs, large cameras, lenses, and tripods to match, I simply slung a Hasselblad around my neck and took off looking like an amateur.

The ambition I've sometimes expressed during my career as a professional was "I wish I were an amateur again." Now I actually enjoy the same unfettered pleasure I had as an amateur on some major jobs and pursue the same goal—capturing the exact moment—instead of creating it.—▶

*MONEY-MAKING IDEAS *by George B. Wright*

THE amateur (or the professional, for that matter) who is submitting prints for publication must consider their content, their technical quality, and their presentation. We talked about presentation last time. Print quality—sharpness, proper contrast for good engraving, good rendition of detail and texture—is covered in many articles in the magazine.

Picture content and appropriateness for the publication to which they are sent would seem to be matters of common sense—until you have opened the mail addressed to any publication in the country. The majority of photographs coming in go immediately back into the return envelopes because they are completely unsuited to editorial needs.

A great many amateurs apparently do not take the time to really study picture-use in magazines. Two magazines very similar in content, covering the same field competitively, are often quite different in their picture requirements.

If you feel that you can break into a particular market, perhaps a magazine which you read because you enjoy its contents, spend an evening reviewing the issues of the past year. What subjects has the editor chosen? Are the pictures seasonal? Does he use singles or series? If the latter, how many and how does each shot contribute to the total effect? Search out the credit lines. Are some types obviously made by staffers or by the same photographer each month?

Only after you understand the kind of pictures and the use which is made of them in specific publications can you really go ahead and look over your files or plan a rough "shooting script" for pictures a magazine is likely to buy.

Inappropriate pictures, those outside the interest of the editor's audience as he interprets it, will bounce back by return mail no matter how good they may be. Others, many others, are in the return mails each month because they are close imitations of photos which were previously used in the magazine to which they were sent or by one of its competitors.

There are two excellent markets for the free-lance to watch carefully. These are the trade and company magazines and the how-to market. Payment rates are low to moderate in most of these, but they are easier to sell than the large-circulation publications.

A hundred or more magazines have at least an occasional how-to picture series. Your hobby, trade, or business should suggest many subjects if you begin to think in these terms. Look in your local library for the issues of the monthlies which carry such features and see how they are handled, the range of subjects, and the treatment.

Many of these features can be made with relatively simple equipment. Flash or flood is usually required indoors and for most close-up shots, indoor or out, to show detail clearly and precisely. Camera and film size are not important, so long as there is no perspective distortion. I've recently seen excellent series made with a Polaroid Land camera.

There are about 9,000 company magazines, the majority of which welcome free-lance contributions. Depending on the exact nature of the particular publication, they are looking for photographs of the company product in use and picture stories of activities related to their line of business. Some of them carry pictures of plant social and business events.

A very large fraction of the magazines in this field also like pictures of girls (from the pleasant to the outright cheesecake treatment) and amusing and curious "feature" pictures.

This is a large field which is hospitable to the competent beginner if only for the reason that few of the editors have very liberal budgets. Look in your local library for the latest copy of the *Gebbie Press House Magazine Directory* which lists about 4,500 of these company magazines, together with their requirements. These subjects are also indexed so you can look up, say, "Home Workshop Hints" and find well over a hundred magazines which accept that kind of material. (If you feel an investment of $19.95 is justified for you, you can get your own copy of this directory by sending that amount to Gebbie Press, 151 W. 48th St., New York.)—▶

Why your next camera should be a new Kodak Retina Reflex

Here—in the finest of modern pentaprism reflexes—is 35mm in truly professional terms.

If you are one of the fortunate photographers who acquire a Kodak Retina Reflex Camera this year, here are some of the things you will have:

True full-area focusing—on a groundglass so fine-grained you hardly realize it is there . . .

Clear split-image rangefinding, centered in the ground-glass, to give you precision focusing even in dim light where detail is barely visible . . .

An ultra-fast *f*/2 Kodak Retina Xenon-C Lens, with 6 elements for optimum linear and color correction and image sharpness . . .

Automatic diaphragm action—lens wide open for focusing, closing down instantly to your pre-selected aperture the moment before exposure—with all of the interchangeable lens units, the basic 50mm *f*/2, the wide-angle 35mm, the long-focus 80mm . . .

Fast-action flash with popular inexpensive bulbs—not focal-plane bulbs—at shutter speeds up to and including 1/500 . . .

A built-in photoelectric exposure meter that measures both *reflected* and *incident* light, and gives readings in both full and *intermediate* EVS numbers on a single clear-reading scale . . .

EVS lens-shutter linkage, for rapid change from high-speed sports-action settings to small-aperture maximum-depth settings *without recomputing exposure.*

No parallax error with any lens at any range—not even in closeups down to 6 inches *film-to-subject* with supplementary closeup lenses . . .

Smooth, fast-action single-stroke thumb-lever film advance, for fast-changing action situations and sequence shots . . .

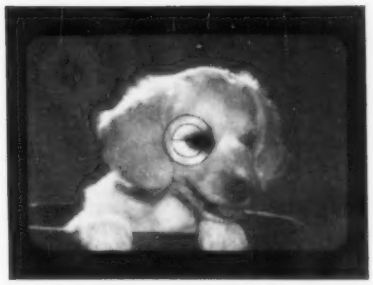
A wide range of supplementary aids—angle finders, sports finders, microscope attachments, filters and closeup lenses, and so on—to provide scope for growth as your interests and fields of specialization grow . . .

Plus the beauty of styling, the dependable construction, the meticulous craftsmanship, that have made the name "Retina" famous throughout the world.

When you own this camera, you own more than a fine instrument of glass and aluminum, leather and steel—more than picture-taking capacity and scope. You own part of the Retina tradition, a personal share in one of the proudest chapters in miniature-camera history.

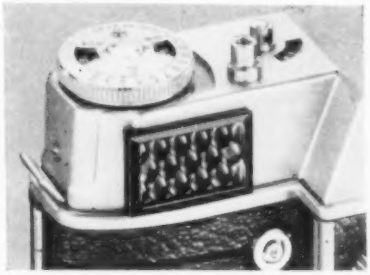
And you will say to yourself: "I can take this camera anywhere . . . rely on it to do anything I ask . . . and wear it proudly in any company."

(Price of the Kodak Retina Reflex Camera is $215. For more details of this unique camera, and what they offer you, see facing page.)

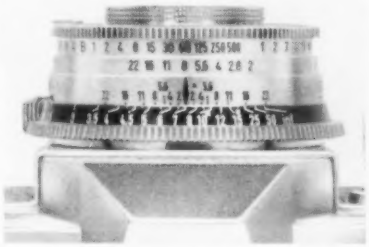


You focus anywhere on the extra-fine ground glass. The picture is big and brilliant through the *f*/2 normal lens, the wide-angle, or the telephoto. You have the combined advantages of parallax-free composition and focusing, plus the naturalness of eye-level viewing. The rangefinder image lets you focus on details within your scene.

Kodak Retina Xenon-C Lens, 6-element 50mm *f*/2; 10-speed Synchro-Compur Shutter, 1 sec. to 1/500, and "B"—self-timer, M and X flash synchronization *at all shutter speeds.* Lens openings from *f*/2 to *f*/22, cross-linked with speed scale. Special "Green Number Scale" indicates exposure in full seconds for subjects requiring time exposures.



Single-scale exposure meter reads high and low light levels without a light baffle. Measures both incident and reflected light. Because there is only *one* light scale, the dial is greatly simplified. You set the pointer and read off the correct EVS number—only *one* number is correct, or necessary. Meter sets for ASA ratings from 5 to 1300.



You make just one basic EVS setting, as indicated on the meter, EVS 1 to 18. Once set you can vary aperture and shutter speed to suit your need—for action stopping or depth of field. The single-stroke thumb-lever film-wind helps you work fast too, advances film, opens and resets shutter, opens automatic diaphragm, advances counter.

Wide-angle and telephoto components interchange with the front component of the normal 50mm lens, by quick-action bayonet mount. The 80mm *f*/4 Kodak Retina Longar Lens Component, $80, reaches out to bring in the distant scene. The 35mm *f*/4 Kodak Retina Curtar Lens Component, $77.50, gives you a broader view in close quarters. Both are matched in quality to your superb 50mm *f*/2.

The fully automatic pre-selector diaphragm lets you view "wide open" always, *even with the 80mm telephoto and 35mm wide-angle—and even in ultra-closeups with front lenses.* It stays open at maximum aperture until the instant you press the release button—then closes down to your pre-selected setting. After shooting, operate the rapid-wind lever and the diaphragm automatically resets to maximum aperture.

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

Old friend with new brilliance

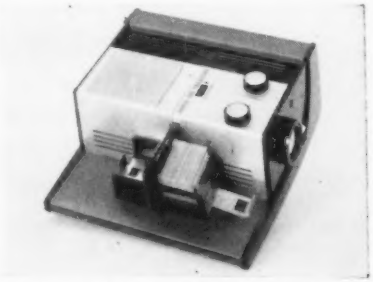
The popular and economy-minded Kodak 300 Projector now has a big brother called the Kodak *500* Projector . . . beefed up to give you 500 watts of dazzling, slide-glorifying screen brilliance.

Its reason for being is, of course, very practical. Some people have rooms that are hard to darken, but they want to look at their slides anyhow. Others need to project the image farther than the usual living room throws. And still others simply covet a pleasing extra margin of brightness for their slides. The new Kodak 500 Projector satisfies all.

As with the 300, the Kodak 500 offers considerably more than just good lamp wattage. It's about as portable as a projector can get—weighs a scant 9 pounds in traveling trim, measures barely 5 inches high, 11 inches square.

Controls for elevation and focus are up on top, work like radio dials.

The 4-inch lens produces big-screen images, even in cramped rooms. Condenser system, with special heat-absorbing glass, accommodates regular and super slides. Push-pull Readymatic Changer is a marvel of efficiency and simplicity—and is interchangeable with popular magazine-type changer.



The new Kodak 500 Projector lists for only $74.50 with standard Readymatic Changer; $84.50 with magazine-type changer. With snap-on cover, projector becomes a self-contained unit—ultra-compact.

Slightly less powerful Kodak 300 Projector is $64.50 with built-in changer; with magazine changer, $74.50. See your Kodak dealer. And for the latest in *automatic* projectors, see back cover, this issue.

Prices are list, include Federal Tax where applicable, and are subject to change without notice.

Kodak
TRADE MARK

Yashica Turret-8 with 13mm & 38mm Yashinon f/1.4 super-speed lenses: $119.90

YASHICA turret 8

Brings "available light" to 8mm filming, with super-speed f/1.4 lenses. Features zoom-finder, 7 governed speeds—and lots more!

If you take pride in your photography—still or movie—you'll want to know more about the Turret-8.

Yashica Turret-8 introduces available light to 8mm movie making. Featuring superb, super-speed Yashinon f/1.4 lenses—13mm normal, 38mm telephoto and 6.5mm wide angle—you can shoot color movies with considerably less light; with black & white, you can film under virtually any lighting conditions.

The Yashica zoom-finder is, in itself, a masterpiece of optical precision. The image is always bright and clear—makes it easy to sight, to compose and to follow action. The finder features click stop settings for 6.5, 13, 25, and 38mm lenses, as well as provision for Yashica-Scope, an optional wide-screen (anamorphic) lens attachment.

Yashica Turret-8 also provides 7 precise, governor-controlled speeds—8 and 12 frames/second for speed-up effects, 16 frames for standard shooting, 24 for sound, and 32, 48 and 64 frames/second for slow motion effects and motion analysis. Single exposures are also provided for titling, animation and special effects.

Yet for all the versatility, Yashica Turret-8 handles like the precision beauty it is. You enjoy sprocketless drop-in film loading, automatic O-set exposure counter, convenient ratchet film wind—7 feet to the wind—and positive film start with rundown stop. First chance you get, see and try the exciting Yashica Turret-8—*you owe it to your audience.* $79.95 with 13mm Yashinon f/1.4

Yashica reflex models: "A" $29.95, case $6.00; "C" $46.50, case $8.00; "LM" $59.95, case $10.00; Yashica-Mat $75.50, case 10.00. New Yashica 44 $59.95, case $10.00. New Yashica 635, with deluxe leather compartment case $69.95.

new YASHICA 8

Single lens model; with all the features of Yashica Turret-8 but with 16 frames/second and single exposures only. Features the 13mm Yashikor f/1.9 focusing lens. $49.95

Yashica YASHICA INC., 234 Fifth Avenue, New York, N.Y.

I Want to Know

continued from page 62

sitive about it. Therefore, they can resort to two technical solutions to the problem: (1) The use of long-focus or telephoto lenses, or (2) Cropping-in on negatives they made from a reasonable distance to get a close-up effect.

The use of long lenses can be an extremely effective solution to the problem. While they mean extra cost in camera equipment, they are usually well worth the price. They permit the photographer to work at a comfortable distance from his subjects, and they help him to be truly candid. The photographer's feelings, if he doesn't like to get up close to people, are spared, and the subject, who often doesn't know he's being photographed, doesn't become self-conscious and start posing for the pictures.

It isn't really fair to call the long-focus or telephoto lens a "trick of concealment." No good photographer is trying to trick anyone into anything. He's only using a medium or technique that will allow him to be unobtrusive and his subjects to be natural. Whether his pictures are an unwarranted invasion of people's privacy from a moral standpoint depends upon the pictures. If he's created a "moment of truth" which others can appreciate and which illuminates the human emotion, his justification for making the picture is equal to that of the writer who does the same thing in prose form.

The other technique—that of cropping-in, especially on large negatives—is essentially the use of your ordinary lens as a telephoto. Once again you can work at a comfortable distance from your subjects and then use only a small part of the negative for your pictures. The re-introduction in recent years of excellent fine-grain films has made this solution even more effective. Remember that the image in a small part of a 2¼x2¼ film can be just as large as one that fills the full frame of a 35-mm negative.

When shooting with this type of cropping in mind, keep what you want to use in the center of your picture where you have maximum sharpness. Even with the best cameras and lenses, image sharpness falls off at the corners, especially at certain lens openings, so that you won't always have an easy time blowing up one of the corners of your large negative.

But if neither of these techniques is available to you, try the one that involves no extra mechanical effort on your part—*get up close* to your subject. It's really not as difficult as it might seem, regardless of how sensitive you may be about disturbing another person.

In the first place, don't project your feelings into the other person who is your subject. Remember, just because you might not want to be photographed that way doesn't necessarily mean that everyone feels like this. If the subject resents your getting up close to take his picture, he'll let you know very quickly. If the subject doesn't mind, you'll be free to make your picture.

Professional photographers soon learn this, and as a result they're at ease when

working close to people. They're absorbed in their work, and not constantly worrying how people feel about having their pictures taken. They usually know when picture-taking would be an invasion of privacy and when it would not. They can sense when pictures should not be taken. It's something they've learned from taking many pictures. With practice, amateurs, too, can acquire this sense and self-confidence.

Usually the hardest part of doing anything is beginning it. Once you start getting up close to people and actually taking their pictures, you'll soon get over your qualms and begin to feel at ease. People may stare at you and they may laugh at you, but when you become involved in what you're doing, this won't bother you.

And if your subjects are involved in what they're doing, they won't pay much attention to you and won't consciously pose. That's another key to close-up photography—shoot pictures of people who are occupied with what they're doing. They may glance at you from time to time, but they too will be absorbed in their own activities. If they pose at first, wait them out. Don't be in a hurry to snap and run. Put your camera down and

CHALLENGE!

MATCH YOUR SKILL WITH THE PRO ON A NEW ASSIGNMENT: "THE CROWD"

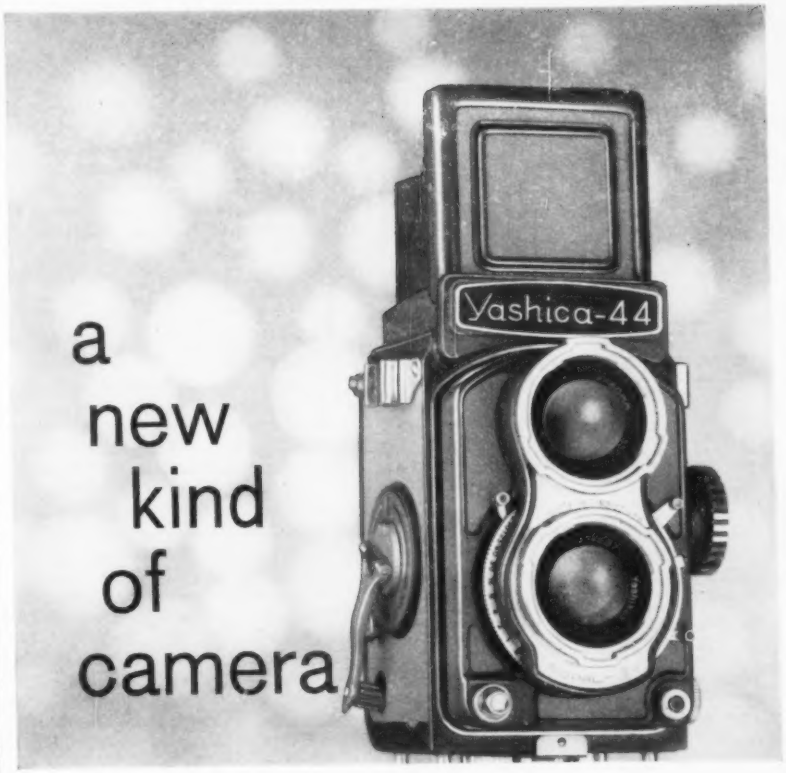
THE PRO: ANGUS McDOUGALL
DEADLINE: JUNE 15

In the next issue you'll see the results of our last **CHALLENGE!** theme, "Ice." Meanwhile you should be sending in your entry for the current **CHALLENGE!** which is "The Crowd." You'll be matching your camera technique with the professional, Angus McDougall, one of the nation's top house-magazine photographers. His deadline and yours is June 15, with the results appearing in the October issue.

How do you plan to capture the essence of "The Crowd"? Interpret this theme in the most imaginative way you can and make your entry one that will stand out in the crowd of entries that will pour in before deadline time.

For each picture selected to appear with Angus McDougall's, we will pay $25. All prints—preferably 8x10 glossy black-and-whites—must be marked on their reverse side with your name, address, and any pertinent technical data.

Do not include postage, for no prints will be returned. The competition is open only to black-and-white prints—no color slides or prints will be accepted. Get your entries into the mail now to **CHALLENGE!** POPULAR PHOTOGRAPHY, One Park Ave., New York 16.—



YASHICA 44

20% smaller, 35% lighter than any standard-size reflex. Delivers 12 brilliant superslides, or 12 jumbo prints—black & white or full color!

Imagine yourself shooting with this precision beauty. Yashica 44 offers all features of the standard-size reflex – and then some. Yet its sleek, rugged body is no larger than a miniature.

Yashica 44 uses 127-size film, delivers color slides 93% larger than 35mm – bright, sharp, *screen-filling*. Yet you can use most any 35mm (2 x 2) viewer or projector – *manual or automatic.*

And if prints are your preference, Yashica 44 delivers 12 oversize prints – black & white or color – the 3½ x 3½" size supplied by most processors.

What's more, with a Yashica 44 you get 12 pictures to the roll – no waiting, no wasting to finish up a 20 or 36 exposure roll to see results.

And with a Yashica 44, getting the results is half the fun. You focus and compose in a large, bright *field-lens* focusing screen. You see the picture – in full color – before you take it. Focusing is fast and accurate; good composing is a breeze, even in poor light. After you've taken a picture, Yashica's unique Power Wind takes over – one forward stroke winds the film; the crank snaps back to its original position.

Other Yashica 44 features include superb, matched f/3.5 Yashikor lenses – coated and color corrected; a super-accurate shutter with 11 settings from 1 to 1/500 second and Bulb; delayed action timer; built-in M and X flash synchronization, and many other features. Be among the first to see and try the new Yashica 44. It's at your dealer's now. See it! $59.95 case $10.00

Yashica A $29.95, case $6.00; Yashica C $46.50, case $8.00; Yashica LM $59.95, case $10.00; Yashica-Mat $75.50, case $10.00.

new YASHICA 635

Convertible: takes 120 and 35mm film. Features field lens focusing, eye-level viewing, and semi-automatic film transport for both film sizes – with rewind provision for 35mm. Includes deluxe leather compartment case. Only $69.95

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ASA 4000? Try the new 'miracle' ULTRASPEED film!
35mm DUPONT S-X PAN 20 exp. roll 70c

Nominally rated at ASA 300, good results are obtained at ASA 1,000 and 2,000. Popular Photography's editors report in the Aug. 56 issue of available light shots at ASA 4,000! S-X Pan has unusually fine grain and extreme exposure latitude—truly a film of the future!

20 exp. ref.	36 exp. ref.	127½ ft. bulk	50 ft. bulk	100 ft. bulk
70c—3 for $2.00	$1.00—3 for $2.75	$2.22	$3.78	$5.50

Daylight Loader with 100 ft. SX PAN $9.99

TESTED SAFETY KODAK B&W FILM

All three popular speeds, Panatomic X (Background X), Plus X and Tri-X are available in 27½ ft., 50 ft. and 100 ft. lengths and 20 and 36 exposure reloads.

PANATOMIC X; PLUS X (ASA 80); TRI X
27½ ft. $1.39 — 50 ft. $2.29 — 100 ft. $3.98

Shipping Charges 10c, 30c, 30c

B&W RELOADS in metal cartridges may be assorted
20 EXP. 40c ea. 6 for $2
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Ship. Chgs. 1 or 2 5c; 3 to 6 20c; 7 to 12 35c.

COMBINATION SPECIAL
5 cartridges, 100 ft. of Kodak Plus X or Tri X or Panatomic X, or 50 ft. of Adox or SX-Pan with daylight loader $7.99
With Deluxe Loader $12.99
Shp. Wt. 4 lbs.

ALL YEAR B&W ASSORTMENT
Daylight loader with 5 cartridges plus 27½ ft. ea. of Panatomic X, Plus X, and Tri-X. $8.88

35mm DAYLIGHT LOADER

INCLUDING 5 CARTRIDGES
$4.95 IF PURCHASED TOGETHER WITH MINIMUM OF $7.95 WORTH OF BULKFILM.
It's so simple to take advantage of the exceedingly low cost of 35mm bulkfilm and to load any desired length into a standard Eastman cartridge. First few reloads already make loader pay for itself. Loader alone with 5 cartridges, $5.95. Sh. Wt. 4 lbs.
DELUXE LOADER, with automatic counter, accepts also Leica, Contax cartridges — $10.95 or add $5.00 to Loader comb. offers

FREE FILM TONGUE CUTTER with your order for $5.00 or more of bulkfilm, or $4.25 worth of bulkfilm plus loader. For perfect shaping of tongue to assure smooth loading. Must be requested at time of purchase. Cutter alone 98c

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FRESH SAFETY 35MM ADOX FILM IN CARTRIDGES AND BULK
Your choice of KB14, KB17, KB21 Shipping Charge 10c
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50 ft. $3.49, 100 ft. $6.99—Shpg. Chge. 25c per 50 ft.
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SAVE UP TO 50% ON
Remote Control Unit For Airequipt
Now you can operate your Automatic Slide-charger (Airequipt, Brumberger) at distances up to 15 ft. — a feature you'd have paid $50.00 more for in other projectors!
WAS $29.95 $9.95* when bought with 12 or more magazines

AIREQUIPT MAGAZINES
2 for $3.18 12 for $18.95 Sh. Wts. 2 & 6 lbs.
12 magazines and Remote Control ..... $28.95* Remote Control (when bought alone) $14.95*
OFFER A66: Shipping Weight 3 lbs. *Argus Model $5.00 extra
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OFFER A24-12: 12 Airequipt Mag. in luxurious luggage-type case (holds 24!), list $37.95. $25.57
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Changomatic, Projectomatic, Powermatic
LOWEST PRICES EVER! 30¢ ea.
Extra strong plastic trays, hold 30 cardboard and glass slides, intermixed, with index. Shpg. Wts. 3, 7, 22, 50 lbs.

In Lots of 120	4 for	12 for	48 for	120 for
	$1.95	$4.98	$17.95	$36.00

12 Trays in metal deluxe case, a $13 list ..... $7.95 Shpg. Wt. 8 lbs.
Sturdy carry case for 12 (Illustrated below) only 50c extra

SLIDE TRAYS for REVERE 553, 555, 888, WOLLENSAK 815
Sturdy trays, hold 36 cardboard and glass slides, intermixed, with index.
12 in carrying case. $8.95
12 in deluxe storage case. $13.49
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REVERE 888 SPECIAL: Remote Control 15 ft. Release plus 12 slide trays in Carry Case ..... $12.49, in deluxe storage case $16.80
Deluxe Storage Case for Revere Trays, leatherette-covered. List $9.95, Spiratone priced at $5.95

FREE with 12 trays or 6 magazines: 10 2x2" COLOR SLIDES or 36 exp. 35mm MICROFILE FILM.

AUTOMATIC PROJECTOR-ON-ROOMLIGHT-OFF SWITCH $1.98
when bought with 6 or more trays or mag. Switch alone $2.98

35 Factory-Packed—One Year Expiration mm SUPER ANSCOCHROME ASA 400 (!)
20 Exp. 1 roll $3.25; 3 rolls $9.05 PROC. INCL. Post. ex.

Want to DUPLICATE color slides with your own camera? Write for folder "Slide Duplicating", naming your camera.

Postage and insurance MUST be prepaid—overpayment is credited. Everything listed is brand new, fully guaranteed against defects. 25% deposit on C.O.D.'s. New York Store: 369 7th Ave. (31st St.)
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after you've focused and made your shutter-aperture adjustments, wait for the right moment.

Also take more than one picture if the situation is good. If people see that you're going to stay around and make more than one picture, they'll soon forget about you and they'll also quit staring at the camera. After a while, they'll become accustomed to you and will soon forget you're there. Then you can make good pictures. If they resent your remaining there, you'll be asked to leave or they'll move on. In any case, you can respect their feelings and act accordingly.—

Photography in Space Age

continued from page 55

to measure astronomical distances by means of exposure time and parallax.

6 Power plant testing. A variety of cameras are used in the giant rocket-engine test stands at Reaction Motors, Inc., White Sands Proving Ground, Redstone Arsenal, Aerojet-General Corporation, North American Aviation and Edwards Air Force Base, to name just a few important big test facilities.

When that time comes, another type of camera and photographer will be urgently needed. Together they will be the foundation of a new kind of journalism—*astrojournalism*. It is particularly important that the lay public understands the significance of space flight to mankind. The whole future of mankind will depend on it. Only a properly trained astrojournalist with the proper equipment can interpret this significance by honestly reporting events, many of which are even today undreamed of.

Nevertheless, right now is the time for photographers to begin their training for a unique future that is creeping up on them only too fast.

There are no space photographers or astrojournalists today. There are some very good high altitude aviation photographers—probably about a dozen or so in the whole country. I will try, in this article, to deal with some of the complex problems that our endeavors to conquer space have created for the new man of photojournalism.

The one man, I think, who comes closest at the moment to qualifying as a space photographer is an astronomer, Professor Clyde Tombaugh, discoverer of the planet Pluto. But astronomers look at photography as a means to scientific ends. They are not reporting to the public. Often they are too absorbed in their work to care about the public. They infer a problem, decide on what instruments they need to solve the problem and then turn this information over to engineers who design the equipment needed. Clyde Tombaugh, it should be noted, designs his own equipment out of his own needs and experience.

What qualifications will this new space photographer have to have?

1 He should have everything that a man like *Life's* Alfred Eisenstadt now has: a good eye, technical understanding of the possibilities and limitations of his equipment, and a feeling for form and light that makes him a kind of poet.

2 He must have an intense interest in

8mm POCKET ACTION EDITOR $9.95
That's right — $9.95! A battery-operated (2 Penlite) electrical action viewer, all metal, shows your 8mm movies, not one at a time, but in full action! You see bright, sharp, magnified full motion pictures, as you turn winding attachment. Editor includes takeup reel, framing and focusing adjustments, two condensers, color-corrected lens, detachable stand—yet measures only 4x6x2", weighs 12 oz. Wonderful for previewing, editing, handy to take along when visiting! Shipping Charge 45c. All metal splicer $2.49, Glue 35c.

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3 WAYS OF MAKING 8MM TITLES $4.95 EACH
$13.95 for all 3

POCKET TITLER
30% off original list
Collapsible, copies 2x2" slides, screws into Series "C" adapter (adapter $1.25 — name lens, camera). Makes titles "on the spot", closeups of flowers, etc. incl. closup lens. Sh. Ch. 30c

CINE TITLER Ship. Wt. 4 lbs.
Permits shooting postcards, newspaper clippings, even animated titles, with closeup lens, requires no adapter

GIANT TITLE SET
420 self sticking vinyl letters, numbers, characters, 5 diff-color backgrounds, 13x18" easel. Ship. Wt. 4 lbs.

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Approximate Shipping Weight, per 5 sets, 5 lbs.

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You'll more than ever enjoy editing your movies when you use this neat, all-metal, electric editing viewer. It projects a clear image on the ground-glass, makes possible viewing from a comfortable distance. Shipping Weight 2 lbs.

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Professional fades with almost every 8mm movie camera! Fader uses two polarizers for complete control, fits series 'C' adapter (if you do not have adapter, send $1.25, naming lens, model, camera.

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300 Watt T8½, SC	reg. each $2.50	..... 2 for $3.25
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LOWEST PRICES EVER $7.69
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The biggest bargains in screens ever! Praised by thousands of movie and slidefans. Metal can has beautiful scratch-resistant finish. Sturdy tripod is plated and has protective rubber tips. Thousands of these screens are in use, not only by amateurs, but by clubs, churches, colleges as well.

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30"x40"	7.69	10 lbs.
40"x40"	9.18	11 lbs.
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Turn handle, and gear smoothly pans your camera, for those really professional panoramic movie scenes! Fits below or on top of your present tilttop or panhead, works with any camera, any tripod. Calibrated in degrees. This feature is incorporated into professional panheads costing $30.00 and more, has never before been available to the amateur.

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Model EL-8P $8.66 INCLUDING PANHEAD
Luxurious Leather case $1.79 extra.
The two most desirable features incorporated into one tripod:
8 sec. pocket size (only 11") and (8" rise) elevator action, with a positive lock. Ribbed top section, chrome plated brass legs extend to 44" (+ elevator), single action 90° tilt and panhead—ideal for every movie, twinlens, 35mm fan. Shpg. Wt. 3 lbs.
For "Quick", Panhead, with rapid camera on-off feature, $4.50 list, only $1.46 extra.
GEARED DRIVE MODEL, ask for model EL-8PG and add 86c to cost.

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bring within **EVERY** photographer's reach subjects which would be too small if photographed at the regular 3 ft. closest camera setting: Head and shoulder portraits, children's pictures, copy work—a whole new field of picture taking.
With extreme closeup lenses, you can get as close as 8" with a Plus 4, 7" with a Plus 5, 5½" with a Plus 6, 3½" with a Plus 10. You can use two extreme closeup lenses, with a double retaining ring, for even more extreme closeups. With a Plus 5 lens, you can fill the complete 35mm frame when reproducing a postcard: a Plus 10 is just right for insects, stamps and coins. Extreme Closeup lenses make macrophotography possible with a tiny investment. **All exc. Plus 10, mounted in metal rings.** *Shipping Charge 10c.*

To fit filter-holders	Plus 1 from 38" to 20"	Plus 2 from 20" to 13"	Plus 3 from 13" to 10"	Plus 4 from 10" to 8"	Plus 5 to 7"	Plus 6 to 5½"	Plus 10 to 3½"
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SER. V	1.39	1.39	1.39	$1.75	$1.95	$2.25	$2.65
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COATED FILTERS IN SERIES SIZES to fit standard filterholders
For B. & W.: Lt. Yel., Med. Yel., Green, Red, Orange, Haze.
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Coated		Uncoated	
Ser. IV	$1.54	Ser. IV	$1.15
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Sh. Chge. 1 to 4 filters 10c

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Neutral Density 2X, 4X, 8X, 10X, Haze 2A, 83, 85B, 81, 81D, Flash 1D, 2D (80C) UV-17, Infra-Red, CC M10, #11, 81A, 82B, 82C.

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CLOSEUPS ARE SIMPLE
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GOOSENECK LIGHT ATTACHMENT $5.95
With C clamps, fits copy-stand or enlarger pole. 2 special reflectorfloods $2.29 add'l. *Sh. Wt. 1 lbs.*

DELUXE COPY STAND
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Shp. Chg. 10c

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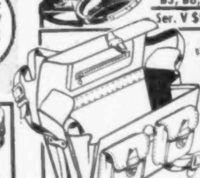

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astronautics, and also space flight.

3 He must acquire (or have) a genuine interest and feeling for astronomy.

4 He should have a vast theoretical and technical background in photography, physics, and chemistry—because he will have to learn through trial and error and must be able continually to analyze his results.

5 He must have a scientific curiosity as well as a curiosity about human beings. He should be in excellent health, have a high spirit of adventure and be willing to take calculated risks.

6 He should be imaginative and inventive.

This astrojournalist of the future will be up against some of the greatest technical problems ever to face a photographer.

As of this writing, the highest a man has ever traveled is 126,000 feet—an altitude where, almost all the conditions are equivalent to those of outer space, in terms of the human body. In terms of optics and chemistry, however, they are not at all equivalent because there is still enough atmosphere to scatter and absorb light. Nevertheless, the air is thin enough (compared with the thicker, filter-like, dust-laden air of lower altitudes and at sea level) to confuse any photographer's estimation of an accurate exposure. In outer space, quite literally, such confusion will be multiplied a million times. Not only will the wavelengths and intensities of light be unpredictable, but radiation absorption may destroy an emulsion image before it is fully recorded. Special shielding may be required to protect camera equipment and film (not to mention the photographer himself) against raw ultraviolet, infrared, and X-radiation. The same thing holds true for protection against freewheeling charged particles of matter, both heavy and light in weight such as iron and lithium. These could do a lot of damage.

At the moment, however, a space photographer cannot simply go out and apply for a job or an assignment in his field. Space flight is tied in too closely with national security, both here and in the Soviet Union. However, it is possible for qualified photographers interested in space photography to find jobs or start projects in related fields, such as the missile and aircraft industries.

Those POPULAR PHOTOGRAPHY readers who have ideas and are *really* interested in this (but I mean *really* interested), could obtain information about financial support for special projects from:

Major O. J. Tibbets, Industrial Relations and Research Division; A/RDC PI Headquarters, Air Research and Development Command; Andrews Air Force Base, Washington 25, D. C.

Office of Naval Research Room 1074, Building T-3, Washington 25, D. C.

Chief, Procurement and Distribution Division, Office of Chief Signal Officer; Dept. of Army Munitions Building, Washington 25, D. C.

Giant advances are being made every day by engineers in the design and building of scientific equipment. Yet strangely enough, with a few notable exceptions, engineers are not the stimulators of today's advances in space photography. Usually astrophysicists with a background in optics or astronomers, such as Clyde Tombaugh, make these advances by adapting their own needs and experience to optics. These scientists dream up the specifications in general for a certain type of camera or telescope or combination of both and turn the specifications over to a truly advanced engineering concern like the Perkin-Elmer Corporation at Norwalk, Conn. Perkin-Elmer specialists combine their know-how in optics and engineering to meet those specifications.

About three years ago, Tombaugh not only designed but built a modified Schmidt camera with an f/1.6 lens and a special drive. With this camera he has been engaged in an intensive search of the regions of space surrounding the earth for a million miles in all directions. This Tombaugh-Schmidt camera is probably one of the most powerful space cameras we have. According to Tombaugh, it could photograph "a clean white tennis ball in bright sunlight a thousand miles out from the earth, or an almost completely dark object of 3-foot diameter nearly 4,000 miles out. Clyde Tombaugh developed and is using this camera to map the orbits of any existing natural bodies (which he calls "orbiting rocks") that might exist between the earth and the moon. This is exceptionally important. Any natural body floating around in space, however small, will be a potential hazard to spaceships—manned or unmanned. One peanut-size orbiting "pebble" striking a fast-moving rocket at high velocity could smash the rocket to bits.

Today's professional photographer is an imaginative, very hard-working guy. He does what he does superbly well—because he's making a living at doing this and he must do it well. If his powers were turned toward space photography, he would undoubtedly prove to be an extremely valuable man.

Within ten or fifteen years, men will be flying to the moon. *This is no exaggeration.* But before a man can get to the moon, I am sure that a camera will have to go there first. Such a proposal has already been made by the Russians and they may well do it before we do if we don't make a concentrated effort. Here is how the Soviet proposal would work. First of all, the camera itself would not be revolutionary. It would be a regular television-type camera with normal wide-angle and telephoto lenses. The revolutionary part of the system would be an automatic, electronically controlled tankette—a tank-like vehicle in which the camera would be mounted. This tankette would be placed in a rocket and shot to the moon. Once it was on the moon, a button would be pressed on earth that would free the tankette to travel over the lunar surface. It would be steered along that surface by radio guidance from earth. The TV transmitter, also controlled remotely by radio, would serve a double purpose: it would be the "eyes" of the earthbound control operator and also a source of visual scientific data. Pictures taken from the receiving screens would probably be stored on video tape.

A camera must get to the moon before man does. It must map the terrain and clear up many mysteries about the moon's crust—whether that crust is composed of solid rock or treacherous dust, whether or not it is radioactive, etc.—and thus the camera will greatly reduce the risk to the lives of men.

I believe that the same technique will hold true for interplanetary exploration as it does for the moon. *The camera must always be first.*

Probably the most exciting idea to come along recently is that of a reconnaissance satellite camera. This camera would travel in an orbit about 4,000 miles out from the earth's center, surveying the earth from space. Any object, even one as small as an automobile, could be seen and photographed by this camera. Lockheed Aircraft's Missile Systems Division has been working on a project for the Air Force during the past three years. It is called Project Pied Piper and is the reconnaissance satellite camera project. It was begun long before any satellites were whizzing around the earth. Here's how it would work: A television-type camera would be placed in the nose-cone of a rocket and shot into orbit. Mechanically, the lenses would be protected by being withdrawn into the nose-cone while the satellite was enroute to its orbit. Then, remotely controlled by microwave signals from the earth, the lenses would be extended and aimed. There would be no appreciable air resistance 4,000 miles out, so the lenses would not even require streamlining. They would encounter no resistance. The television camera would store pictorial information, again probably on video tape. When the satellite moved over a receiving station on earth, the station would trigger the storage mechanism and obtain the photographic information. The satellite-camera would be revolving around the earth from pole to pole, thus causing the entire world to turn beneath its orbit and by this 90-degree opposition of motions thus giving the satellite camera a chance to scan every square inch of the world. With normal lenses (those equivalent to what the human eye could see) it could observe at any one moment an area of some 90 million square miles.

I believe that cameras—television and motion picture cameras—mounted on space stations and in rockets traveling freely through space could gather vital scientific information for all people.

Telescope cameras on earth have recorded small orbiting bodies in the neighborhood of our planet. In fact, their orbits cross the path of the earth's orbit. Since 1932 a dozen of these celestial "rocks" have been discovered.

So cameras in space recording and mapping the trajectories of such "flying mountains" might conceivably save the earth from destruction — provided a method could be devised to cause the "mountains of rock" to deviate from crossing the path of the earth. Nor would such a method be impossible of achievement to science. Dr. Fritz Zwicky, world-renowned astrophysicist, has already proposed shifting the planets of the solar system into new orbits through the use

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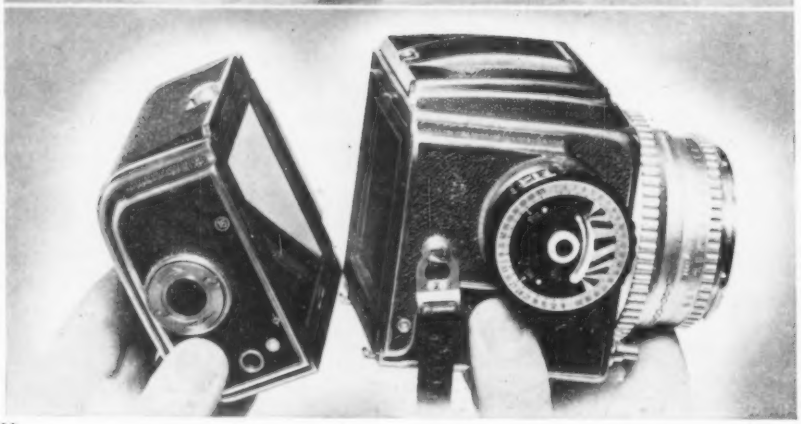
of nuclear energy. At the very least, space satellite cameras should make people realize that it's kind of silly for them to fight each other, that the important thing above everything else is to get together for a purpose—try to use all their energies and resources, all their scientific knowledge, not only for the survival value of avoiding cosmic collisions but for adding to mankind's all too small a store of knowledge about the universe as well.

Photography, in the near future, will be probably the most important tool in the study and long-range forecasting of weather—especially in Dr. Harry Wexler's concept of a weather-patrol satellite. Dr. Wexler is head of research at the U. S. Weather Bureau. He has conceived of a camera to be placed in an orbit—the same kind of orbit as the reconnaissance camera mentioned earlier—that would permit it to patrol the world four times a day observing and reporting the movement of cloud formations as well as measuring the earth's albedo. (Albedo is a technical term for the amount of light reflected back into space from the earth's surface.) Dr. Wexler's weather-patrol satellite cameras and instruments not only could detect storms and cold fronts in motion (both are always accompanied by certain kinds of cloud formation) but could also determine the length of time these weather disturbances would take to reach a particular spot on earth. Therefore, long-range, weather forecasting could be made faultlessly. At present, even short-range—in fact, hourly—forecasting averages only from 50 to 75 percent in accuracy.

Another exciting aspect of space-age photography is the corner-reflector. Simply, the corner-reflector satellite is made up of optical or radar reflecting surfaces of any number—each at right angles to the other. The optical corner-reflector picks up light from all directions and channels it into one direction. An optical corner-reflector satellite could pick up light-images from any one 180-degree area of space and send them simultaneously to a receiving camera on earth or on another type of satellite. This would be equivalent to photographing the total horizon on earth simultaneously as seen from any point on any half of the compass. Corner-reflectors orbiting outside the earth's atmosphere could gather undistorted light from bodies trillions, quintillions, sextillions of miles distant and retransmit it to a satellite-camera carrying video tape to store the impressions for later analysis. In a sense, the combination of these two satellites would provide men with a kind of super periscope with which they could look through and far beyond the atmosphere.

We will probably shoot corner-reflectors into orbit around the moon before sending crews there. Eventually, we will place corner-reflectors as well as other types of satellite in orbit around planets as widely dissimilar as Venus and Jupiter. None of this is as fantastic as it might seem. It is within the grasp of present-



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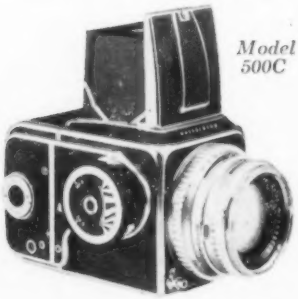

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day engineering technology and physical knowledge. I believe many scientists would support me in this statement.

I firmly believe that editors and TV producers must begin a staff-training program *right now* for space photographers and reporters. I am absolutely certain that there are greater stories undiscovered right at this moment in space than all the stories that have ever before been written or photographed during the whole history of mankind!

In the past it has been the amateur astronomer who turned to photography. Now I think the wheel will spin the other way. And the more photographers there are who begin to aim their cameras at the stars—still cameras with long lenses or telescopes with cameras attached to them—the better off will be science. This holds true of the motion picture amateur experimentalist as well. The more amateur space photographers that come into being within the next few years, the more pictures will we obtain of space objects and the more pictures there are, that much more information becomes available to science and thus the more we learn about the universe.

If within the next ten years or less there should be 100,000 amateur photographers across the country interested enough in space photography, it would be quite possible for such amateurs to organize themselves enough to launch their own orbiting space camera. They could chip in a few dollars each and buy a corner-reflector (or even design and build their own peculiar type) as well as defray the cost of using an operational military rocket for shooting it into space.

The most important thing of all photographically is that the camera can "see" things not available to the human eye or the telescope, in combination or alone. By controlling length of exposure time and using specific filters and film emulsions, men are able to record and thus study objects as far away as two billion light-years out in space. This is an incomprehensible figure made possible by the camera. It is roughly twelve sextillion miles—or 12,000,000,000,000,000,000,000 miles.

I personally feel that the miniature camera is important to space photography.

As a high-altitude photographer myself, I am personally sold on the Canon Vt. To me, this precision-built Japanese 35-mm with its almost incredible array of equally precision-made lenses—everything from 25-mm wide-angle through 800-mm telephoto as well as apertures from f/1.2—is already the basis of an ideal camera for space photojournalists.

Naturally, almost numberless innovations will have to be made in the perfection of a true space-journalistic camera. The rest will depend upon two vitally important factors: (1) the successful launching of a manned spaceship or manned space station and (2) your being aboard that ship or station (in order to acquire the precise experience needed to inform and advise camera- as well as lens-designers about what kinds of equipment will truly be most useful in outer space journalism).—

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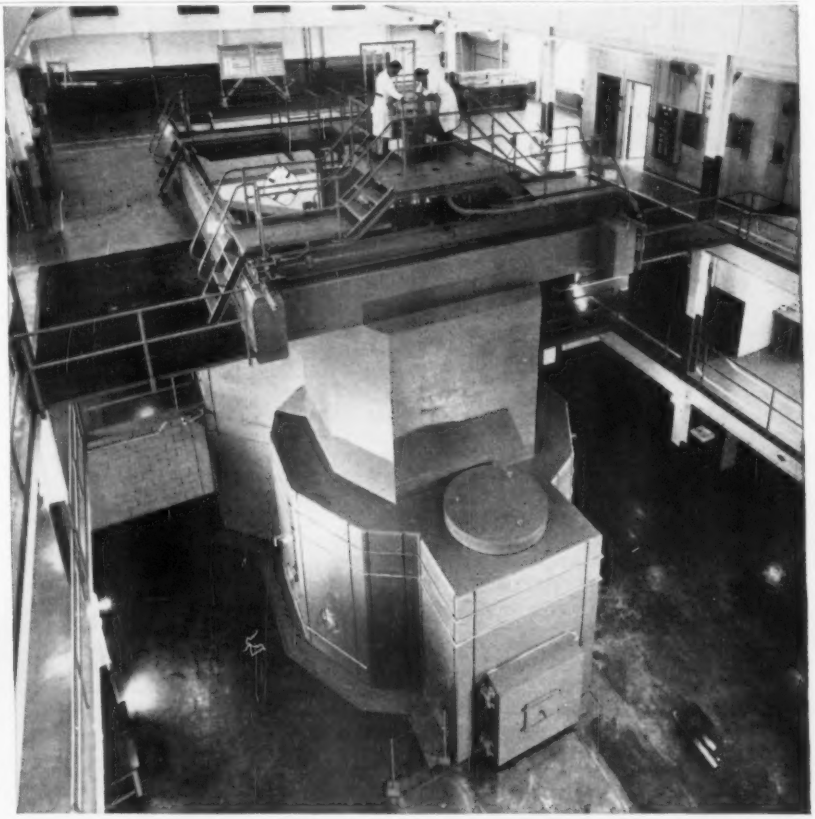


Photographed at Batelle Memorial Institute by Herbert Loebel with the Hasselblad Superwide.

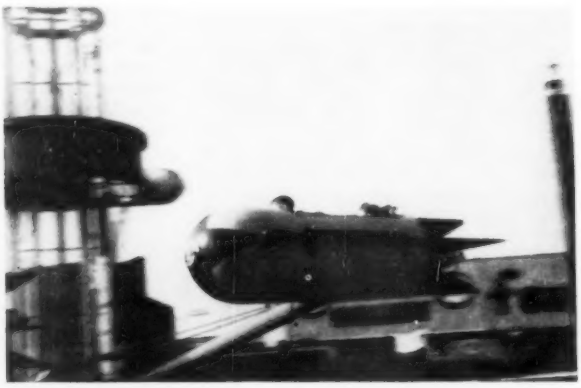
Roger Tilton says

MOVIES MUST MOVE

A film maker and teacher discusses the problems of action in motion pictures

SUBJECT MOTION

Subject of shot moves while camera remains stationary. Result is that only subject blurs. Amount of blur depends on camera angle, with maximum blur across axis of lens and when subject is closest to camera.



CAMERA MOTION

Camera moves with moving subject holding it relatively stationary in frame. Less often, it moves over subject, such as panning over landscape or around room. When camera follows subject, background blurs.

RENÉ CLAIR, the great French director, once said: "The cinema has been created for the purpose of recording movement. This is a truth which nobody has attempted to dispute and yet it is constantly being forgotten."

The real subject of every motion picture is movement; the fast, slow, dynamic processes of life which, when projected onto the screen, hold the eye in dazzled attention.

As a newborn infant one of the first things we become aware of is movement, and movement, in one form or another, continues to catch and fascinate our eyes for the rest of our lives. A blurred movement, seen from the corner of our eye, alerts us to the danger of an approaching car. The tiny figure of a man on horseback, moving across a still landscape, holds our attentive gaze. Movements have meaning for us (the shake of a head), fascination (the dancing flames of a fire), and breathtaking beauty (the majestic cascade of a giant waterfall—an antelope's bounding flight). These and a thousand more—a rich world of movement—waits to be seen and interpreted by the film maker, captured with his camera, and spread across the screen for the pleasure of his audience. Leave it to the still cameraman to pose his subjects for a portrait. Let him freeze each moment in a perfect, static composition. The movie maker's objective is completely different! For him, people are not stone statues to be grouped in lifeless tableaux, but movers, doers, to be filmed *in action*. A city is not a static collection of buildings—a cityscape—but a thousand and one movements of people, traffic, revolving doors, and blinking signs. Photograph a flower; motionless on the screen it is a pretty picture; let a breath of wind animate it and the very air surrounding it becomes a palpable presence before our eyes. The principle is simple: in all cases the *subject* of the motion picture is not just the object before the camera, but the *motion of* that object!

Learn to see that the family car looks best when it is driving off to a picnic, filled with life, not when it is standing inert at the curb. See an egg beater as a *whirling* cylinder, a child as a bundle of *activity*, a vacation trip as a procession of *passing* scenes. Here we have the second miracle of the movie camera. It can not only capture the movement of things before it but, through its own movement, can set the inanimate world in motion on the screen. Tall buildings rise majestically from the bottom of the frame, *if* we tilt down on them from the sky. Forests of trees march like soldiers across our screen and a bird hangs suspended in a whirling sky as we follow it with our camera. Whether through movement in the object photographed or movement of the camera itself, what counts is that the image *on the screen* move.

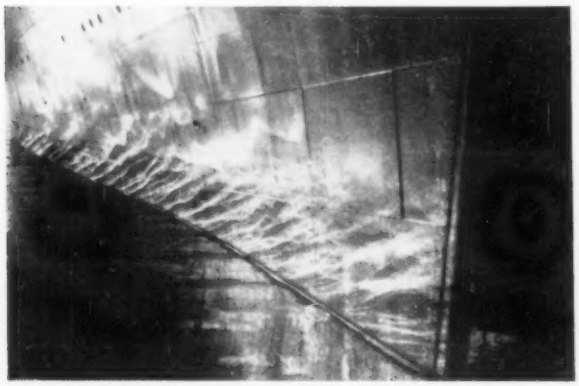
There is a third important, though rarely used, source of movement for the screen image. Even when the object before it and the camera itself remain still, movement results on the screen *if* the lighting of the scene moves. Lights and shadows can be made to flow over the face of a statue by moving the off screen spotlight illuminating it. Firelight can flicker over a living room scene, and light

from coach windows speed over the ground as a train passes. Thus the three sources of movement in the image on the screen are: (1) movement in the object photographed; (2) movement of the camera; and (3) movement of the photographic lights.

Whatever the cause, a movement on the screen can be assigned a direction, a rate of speed, and an area. The same train traveling west at 40 miles an hour can be made to traverse the screen from any direction and at a great many different rates depending on what angle and distance it was photographed from. From top to bottom and left to right, or right to left, filling the whole screen or creeping slowly across the bottom, the same train will appear on the screen in many different guises depending on whether it was photographed from overhead, the left or right, straight ahead, or far or near. The sensitive film maker will orchestrate these movements, alternating them, contrasting them, building them into a rich symphony of motion. Whole films have been made around the myriad movements to be found in an amusement park, a speeding train, reflections in wet pavement, and the homely sewing machine.

When filming is finished and the time for editing arrives, motion should still guide the film maker. Now however, movement should dictate the sequence of shots and even the exact point at which to cut. The wave of a hand in one shot can signal the cut to a shot of a departing train. In cutting from long shot to close-up, look for an action which will justify the change of angle; the carpenter (in long shot) picks up his hammer and (cutting to a close-up) hammers in the nail. The *direction* of movement across the screen must be carefully watched in cutting shots together. A person walking from left screen to right should not suddenly, through a reverse angle camera position, be made to walk from right to left. When you have two shots with a change in screen direction try to insert a shot between them which explains the change; a man turns a corner in his walk, the horses round a bend at the racetrack.

Of all the cuts using motion, the strong-



LIGHT MOTION

Light on subject moves but both camera and subject remain stationary. The changing light within shot provides the necessary motion. Illustration shows moving reflection of light from water onto hull of ship.

FOUR RULES OF MOTION

1 **Include one** of the three kinds of motion (subject motion, camera motion, motion of light) in almost every shot. Use your movie camera to capture movement and *not* static scenes.

2 **Keep the audience** oriented as to the direction of motion in your shots (the same motion can look very different depending on the angle from which it is filmed). Make sure the direction of movement on the screen is consistent. Don't show someone walking from left to right in one shot and then, by a change to a reverse angle camera position, right to left in the next.

3 **When cutting** from one shot of the same subject to another, from a different angle or distance, try to make the cut on action and match the action between the shots. Example:

Shot 1: Long shot. A man sits at a desk. The phone rings. He reaches for it and starts to pick it up.

Shot 2: Close-up. He lifts the phone to his ear and speaks into it. The cut could be made just as he lifts the phone off the receiver. The action of lifting the phone would be matched from one shot to the next.

4 **Make the motion** in one shot motivate the cut to the next when cutting from one shot to another containing a different subject.

Example:

Shot 1: Close-up. A man turns his head and looks off screen.

Shot 2: A pretty girl walks down the street.

CREATING WITH FILM

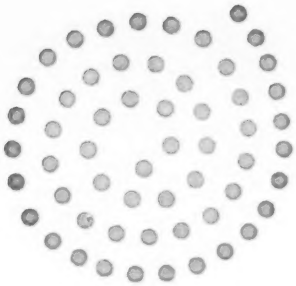
By CHARLES REYNOLDS

A FEW weeks ago I was talking to a friend about making the transition from still photography to movie making. This person commented that it should not be very difficult for the good still photographer to switch to movies or vice-versa because "after all, most of the same principles apply." This seems true only on a superficial level. The basic knowledge of exposure and lighting learned from still photography will, of course, be of aid to the movie maker. However the creative principles of the two seem to be diametrically opposite.

In still photography, the photographer looks for the "decisive moment." He tries to capture on film the particular moment out of many moments which sums up and expresses the essence of a particular event or feeling. Henri Cartier-Bresson, who first formulated this concept of the "decisive moment," stated in POPULAR PHOTOGRAPHY: "To me, photography is the simultaneous recognition, in a fraction of a second, of the significance of an event as well as of a precise organization of forms which give that event its proper expression."

The movie maker works in almost exactly the opposite way. Instead of working for a single, self-contained still picture that portrays an event, he attempts to portray that event through a series of pictures that are in motion. Unlike the good still photograph, each of these pictures or shots has little meaning outside of the context in which it is edited. Each of these shots is important not as a complete statement but as a unit that is used to construct a sequence of shots in motion which makes a statement.

Only when the shots are put together in the proper order and lengths does the meaning arise. If the order or lengths of the shots were different an entirely different meaning could be produced. This principle of creating meaning through editing is called "montage" and it is the basic creative principle of all film making. Separate shots taken at various times and in many different places can be combined on the editing bench to construct a place or an event which never existed in real life but was born only out of the way the shots were combined. This construction of a filmic reality, by means of montage, is almost the exact opposite of the decisive moment which forms the key creative principle of the still photographer.—



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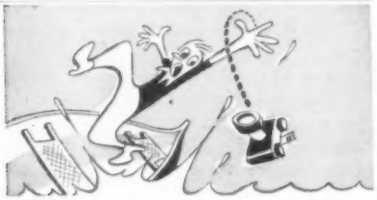

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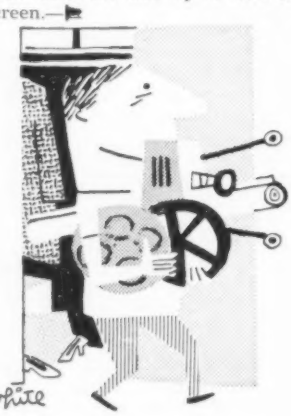
est is to cut so that the action begun in one shot is exactly continued in the next. "Action matching" requires that there be a smooth flow of action *across* the cut. Motion thus welds the two separate shots together as if they were one. Without the strong unifying effect of the movement, the shots would follow each other in abrupt, disjointed jumps and the film, as a result, would remain nothing more than an assemblage of isolated pictures.

But the over-all organization of a film must take into account more than the immediate movements over the surface of the screen. Beyond movement there is change and growth. The slow dawning of pleasure across the face of a child under the Christmas tree; the puppy maturing into the dog; the shapeless boards becoming the boy's birdhouse; the melting snow and coming spring—all the metamorphoses of life which are results of either the flux of nature or the shaping will of man. These are the ultimate subjects of the moving picture camera. The function of the film's story is to provide this larger movement. Things must go forward, progressing from stage to stage. In filming any development look for those moments where change actually occurs. If you film a boy building a birdhouse don't set up a static picture of each completed step. Instead, pick those points where change occurs, where the raw boards are *sawn* to size, where sides are *put* together, the roof *hammered* on, and paint *applied*. These are the points where a birdhouse actually comes into being and grows before our eyes.

In filming people it is what they *do* that counts, not what they are, or look like. As they change and move, run and grow, they live for us on the screen, and the stories we film should reflect this animation. A moving story about people will, in turn, move its audience, carrying them along with the tides of trial and tribulation portrayed on the screen. The progress of a tragic downfall, the triumph of a long struggling climb, a chase or a growth all give a film its basic dynamism. The deep groundswell of the story line moving ahead, shimmering and sparkling with the surface movements of the screen—caught and ordered with the camera, is the ultimate creation of the film maker. The world's treasury of movement, large and small, is the Eldorado of the movie maker. As fleeting and ephemeral as it is, he must reach out and try to hold it on his screen.—



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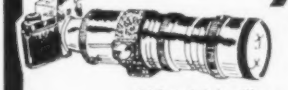

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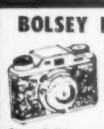

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MOVIES

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Movie maker uses pocket-size equipment for location shooting

Mohawk Midgetape recorder is small enough to be carried in pocket or over shoulder in case. Mike, clipped low on coat, lessens camera noise.

By LES BARRY

IN THE last two years, because of the rapid development of home movie camera quality, it has become possible for the amateur movie maker to make near-professional films with an 8- or 16-mm camera. But for the advanced amateur this high point of results-on-film still represents only a partial victory in the battle to bring professional movie making down to the gadget bag dimensions enjoyed by many professional still photographers. Still missing is the sound.

Of late, however, a good number of portable tape recorders have appeared on the market, and I set out to learn whether or not these held the answer.

In deciding which portable tape recorder to test extensively in this regard, I established the following criteria: it must be lightweight, small, compact, relatively inexpensive, and easy to switch on and off. Although there may be other tape recorders on the market to fill this order, we found the Mohawk Midgetape 300 readily available.

The Midgetape sells for $249.50 (we said "relatively" inexpensive) and includes an hour-long cartridge of recording tape, a battery, and the microphone. Many other accessories are available, and will be discussed below.

Here are the physical characteristics of the machine:

It weighs only three pounds and may be carried easily or slung over your shoulder in its own carrying case, which looks somewhat like a camera case. It has only three controls—an on-off switch, a play-record control, and a volume control. It uses a single battery for motor, recording, and amplifier power and takes cartridge-loaded tape.

In testing the Midgetape for simultaneous sound recording while shooting a 16-mm movie, we tried to record three basic situations—background sound, actual sound which did not require exact synchronization, and lip-synchronized sound. With the recorder over our shoulder and the microphone clipped to our jacket we went camera in hand to New York's Chinatown to shoot some test footage. In order to monitor the recording device during the actual shooting session we used the single plastic earphone attachment. A double earphone

continued on page 116

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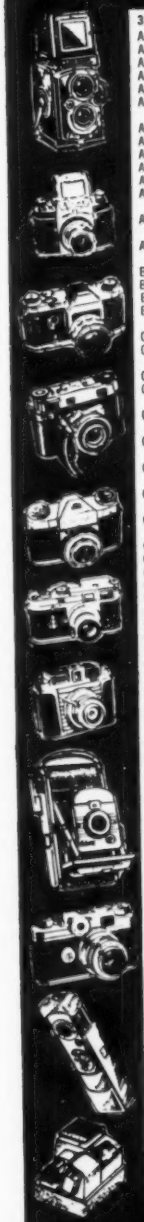

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Beauty Canter '35'	49.00
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Braun Super III Auto	*
Canon VT Body	150.00
Canon VT f1.1 Zunow	332.00
Canon VT f1.8	199.50
Canon VT Deluxe f2.8 Canon	207.75
Canon VT Deluxe f1.5 Canon	282.00
Canon VT Deluxe f1.2 Canon	343.50
Canon LI f2.8 Canon	195.00
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Contax IIA f2	199.50
Contax IIA f1.1 Zunow	299.50
Contax IIIA Body	188.00
Contax IIIA f1.5	259.00
Contax IIIA f1.1 Zunow	330.00
Contina	39.00
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Edixa Reflex C f1.9 auto Quinon	213.00
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Leica M-3 f2 Summicron	349.50
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Nikon S2 f1.1 Zunow	330.00
Nikon S3	*
Nikon SP Body	265.00
Nikon SP f1.4	*
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Paxette Super III Auto. f2.8	112.50
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Pentacon P f2	157.50
Pentacon PB f2	189.50
Pentacon Auto. Westagon f2	139.50
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Praktina FX f2	*
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Prominent f1.5	199.50
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Ricoh 500	49.50
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Robot Star f1.9	99.50
Royal Super f3.5	44.95
Royal M35 f2.8	52.50
Royal M35 f1.9	67.50
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Samoca f3.5	22.50
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Topcon	*
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Vito BL f2.8	69.00
Vito B.L. f3.5	58.00
Vito IIA f3.5	44.00
Vitomatic I	*
Vito BR	*
Vitessa T f2.8	116.00
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Vitessa f3.5	74.00
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Keystone K-75	57.00
Keystone K-100	74.50
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B & H 302 Sound	*
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B & H 200	*
B & H 200 EE	*
B & H 70 DR	*
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Kodak Royal II f1.9	184.75
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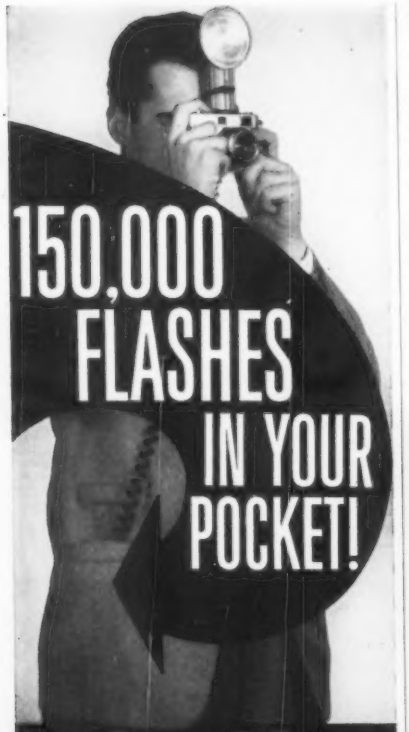

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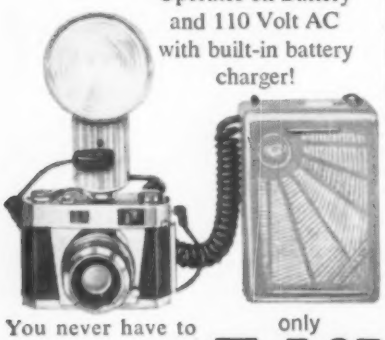

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The Rangefinder

continued from page 47

tography among young people. There are strong reasons why the daily press should want to encourage careers in photography; the *Citizen* is helping itself (and journalism) as well as the school.

For understanding . . .

The Freedoms Foundation at Valley Forge, which is dedicated to uncovering and rewarding activities which "build an understanding of the American Way of Life," gave its top Americana award in photography for 1957 (a medal) to Albert Moldvay, staff photographer for the

MOLDVAY'S MEDAL-WINNER
For refugees, open American arms.

Denver Post. It wasn't Al's only prize last year; he also took two in POP PHOTO's Picture Contest. The Foundation winner was a shot of a Hungarian refugee family being greeted in a railroad station by their American hosts.

Candid shots . . .

The sixth biennial *photokina* exhibition will be held in Cologne, Germany this fall, from September 27 to October 5. Two years ago it had 200,000 visitors from all over the world; officials are hoping for still bigger things this time.

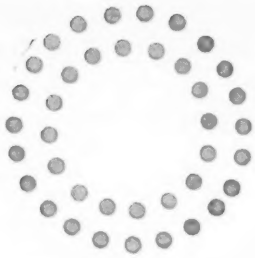
Milt Freier, *who writes a newsletter for 35-mm press photographers, reports heavy response following our recent item about it. For a sample, write him at E. Leitz, 468 Fourth Ave., New York City.*

The photojournalism division of PSA is offering a new critique service for members' picture essays or individual photographs. For information, write to **Lewis E. Massie,** Box 745, Del Mar, Calif.

Professional Photographers of America holds its convention and trade show at the Conrad Hilton Hotel in Chicago, July 20-25. Reservations through PP of A, 152 W. Wisconsin Ave., Milwaukee 3, Wis.

The German Camera Industry Today, a 16-mm sound film, is available for bookings by television stations from Modern Talking Picture Service, 3 East 54th St., New York 22, N. Y.

Joseph Woodson ("Pops") Whitesell, *82, beloved veteran salon exhibitor, died on Feb. 18 in the French Quarter of New*



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Orleans, after a five-year illness. He was near the top in PSA ranking, once had photographs accepted in 83 shows in a single year.

First prize in the People-to-People Program's photo contest for foreign students ($500) went to **Tibor Ardai,** a Hungarian who is studying at New York University.

Yumi Shirakawa, *pretty Japanese film star, has been adopted as "Miss Yashica" to help with international publicity for cameras bearing that name. She has held the same title in Japan for some time, and came to the U. S. for this year's Japanese Film Festival.*

Yumi

In April, we learned of the death of two veterans in the photographic field: **O. A. Solbert,** director of George Eastman House in Rochester, N. Y.; and **Dick Tucker,** theater and ballet photographer and charter member of ASMP, who was working in Venice at the time of his death.

Peter Pollack, *for 12 years Curator of Photography at the Chicago Art Institute, has joined the publishing firm of Harry N. Abrams, Inc. as associate publisher. This fall, Abrams will issue Pollack's* Picture History of Photography.

Readers who'd like to build their own electronic flash unit are referred to the current (June) issue of our sister publication, POPULAR ELECTRONICS, which carries diagrams and instructions for making a "high-efficiency" transistorized job.—

Charles D. Sharp

THEY'RE MOSCOW AMATEURS

The avid photographers on page 47 were aiming at a pretty American tourist in Red Square.

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PHOTOSENSITIVE PLASTICS—
will they revolutionize photography?

Slide-O-Film, first of these to reach the market, is processed in boiling water in just two seconds

By BOB SCHWALBERG and GENE GAINES

FOR NEARLY A DECADE a handful of research teams scattered across the country have been at work on an exciting new family of plastics that are sensitive to light and which promise to revolutionize the photographic process as we know it today. Ever since Daguerre, all picture-taking processes have been based upon the silver halide particles which, when light-struck, permit development to metallic silver.

These amazing new photosensitive materials do not depend on silver halides, but utilize certain plastics and plastic compounds that respond to light.

The whole field of plastics, based on complex organic chemistry, has proven itself to be almost limitless in the variety of materials that can be produced. Photosensitive plastics researchers feel that they have but nibbled at the edges of their special field, and much of their work has been closely guarded as trade secrets. We are aware of four quite different processes that are presently under development. None of these has reached the stage where they can be exposed at hand-held shutter speeds in a camera, but a brief review of them will, we think, indicate the exciting possibilities in what may be termed "photosensitive plastics."

One of these is just now reaching the photographic market, having been distributed in the New York area for several months. This is Slide-O-Film, sold under this name by the Charles Beseler Company of East Orange, N. J., and manufactured by the Kalvar Corporation, New Orleans, La. Beseler is the exclusive distributor of all Kalvar sensitized products in the general amateur photographic field, and in the audio-visual and certain graphic arts fields.

Slide-O-Film consists of an ultraviolet-sensitive plastic emulsion containing diazonium salts, coated on to a DuPont Mylar base. Mylar, the support used in many magnetic recording tapes, is a very tough, waterproof plastic.

When struck by ultraviolet light, the diazonium salts (the same sensitizer, as the name implies, used in the diazo process) release minute quantities of nitrogen gas which is held under pressure by the solid plastic emulsion layer. This complex of tiny nitrogen "pressure points" is equivalent to the latent image in silver-halide photography. The developing agent is simply heat, which temporarily softens the plastic in the emulsion so that the pressure points trapped within are permitted to expand. In so doing, pockets, or bubbles, are formed within the emulsion. These bubbles are practically colorless. However, when Slide-O-Film is projected or printed, the bubbles scatter the transmitted light rays, thus having the same effect as the opaque silver image in conventional films.

Slide-O-Film is available from Beseler in 35-mm rolls and 2¼x2¼ sheets, and is intended for making positive transparencies from black-and-white negatives or producing black-and-white negatives from color transparencies.

All that is needed for producing a finished Slide-O-Film is a source of ultraviolet light (a special UV lamp, or a very bright incandescent lamp such as that used in a slide projector) and heat of 210-to-240 F (boiling water is recommended) for development. However, simultaneous with the introduction of Slide-O-Film, Beseler also has introduced the Slide-O-Printer, a $29.95 unit with a tiny contact printer for exposing Slide-O-Film, and a heated roller for developing it. The Slide-O-Printer accommodates either of the two film sizes available.

Although our tests can hardly be termed conclusive, this is our opinion as of this moment:

(1) Slide-O-Film is an excellent means for producing projection positives from

Slide-O-Film makes:

Positive transparencies from black-and-white negatives. Here is actual photograph of Slide-O-Film transparency projected onto screen. Girl, silhouetted against screen, holds original 35-mm negative. Results are excellent.

Black-and-white negatives from color transparencies. Negative can be printed on soft grade of ordinary photographic printing paper. Reproduced is print blown up from Slide-O-Film negative made from 35-mm Kodachrome.

How to use it:

Expose by ultraviolet light. Sensitive to ultraviolet only, Slide-O-Film can be handled in room illumination. Contact-print in special Slide-O-Printer (above) or sandwich in slide binder and expose in ordinary slide projector.

Develop by heat. The Slide-O-Printer has a special thermal roller for necessary heating to develop image. Any method of heating to 210-240 F will do. Most convenient is dunking in boiling water (above) for several seconds.

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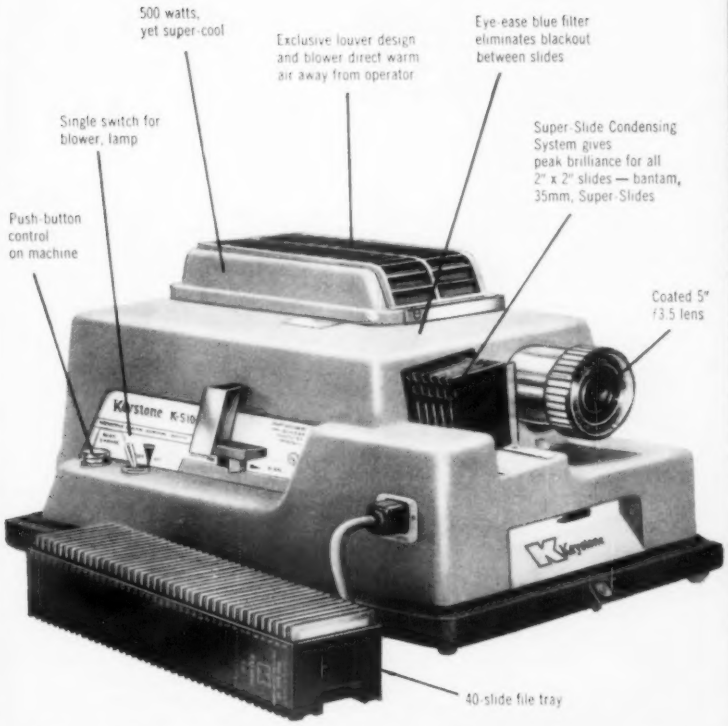

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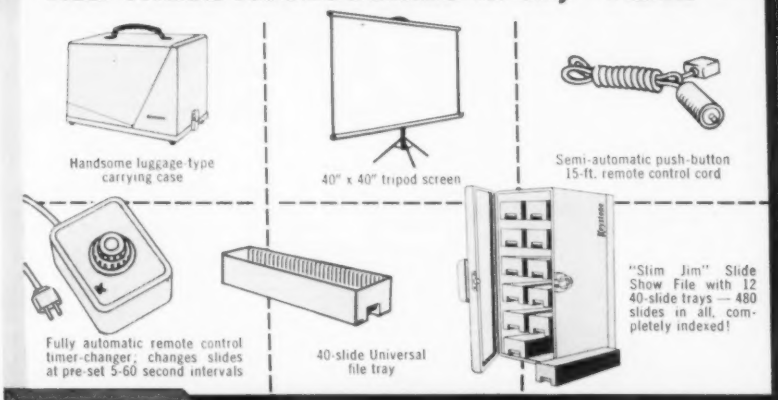

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black-and-white negatives. Resolution is more than adequate for projection and, except in the case of overexposures, contour-sharpness is excellent. Grain is excellent. Upon projection, the light-scattering bubbles produce an extremely good screen image with full tonality.

(2) Slide-O-Film is considerably less adept at the production of black-and-white negatives from color transparencies. The negatives themselves are readily obtainable, though requiring many times more exposure with color than with black-and-white. The rub is, however, that in printing, these negatives produce excessively contrasty results which defy the softest of print-making techniques. The difficulty appears to lie in the nature of the color transparency itself which contains a variety of dye-stuffs with widely varying UV-absorption characteristics. Yellows and reds, accordingly, give more trouble than blues and greens, while the worst possible colors in our experience were oranges, browns, and similar warmish color mixtures. Be this as it may, it must be admitted that the process will provide a rough black-and-white copy which will probably be adaquate for many users.

Unusual property of Slide-O-Film image

Viewed against light background (left), Slide-O-Film positive image *looks like a positive*. Same piece of Slide-O-Film illuminated from the front and viewed against a dark background (right) *appears as a negative*. This is due to light-scattering effect of the bubble image.

The beauty of the process is, of course, its ability to produce positive or negative transparencies under normal room-light conditions, without the need of a darkroom or chemicals, in a matter of minutes.

Here are a few more facts which turned up during our testing: When Slide-O-Film transparencies are placed in very hot projectors immediately after development, the heat sometimes tends to continue the development process, causing the build-up of additional slide bubble-density. To prevent this, the developed slide should be fixed by simply re-exposing to UV light in the Slide-O-Printer for about 30 to 45 seconds, then waiting 24 hours before projecting for more than 50 seconds. This also acts to clear a slight warm cast from the transparency.

To reduce contrast prior to making Slide-O-Film negatives from color transparencies, we found that prefogging the film alone in the Slide-O-Printer for from 5 to 15 seconds was extremely effective, although low-contrast detail resolution was somewhat lessened by this procedure.

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Many firms are at work on methods and equipment to exploit the unique advantages of the Kalfax (Slide-O-Film) material in scientific, industrial, and military applications. The producer, the Kalvar Corporation, is presently setting up marketing plans and establishing dealers in these fields.

Here is a brief survey of the three other photosensitive plastic processes:

THE DU PONT PROCESS. Since 1947, the DuPont Company has been working on a new process for making letterpress printing plates called Photopolymer Printing Plates. Based on a photosensitive plastic, this process also employs ultraviolet light for the exposure (as do three of the four processes) which causes a hardening action in the plastic. An alkaline water solution washes away the soft, unexposed areas, leaving the exposed (hardened) areas unaffected, and producing a relief image. Photopolymer Printing Plates though still in the experimental stage, have proved themselves in practical applications.

THE FERRO PROCESS. The Ferro Chemical Corporation of Bedford, Ohio, has been at work since 1953 on another photosensitive plastic which they have named Calimar, a homogeneous photosensitive plastic which is currently supplied in liquid form. The material is oven-dried in sheets several times the thickness of conventional sheet-film, then contact-printed with a conventional photographic negative by exposure to UV radiation. The film is developed, by oven heat (about 325 F) for 5-15 minutes. The result is a thick, flexible positive transparency said to be extremely tough and resistant to sunlight, moisture, and atmospheric conditions that are normally harmful to conventional photographic images.

The photosensitive material here is polyvinyl chloride which releases hydrogen chloride gas in direct proportion to the amount of UV radiation received. The gas triggers a chemical decomposition in the plastic, when sufficient developing heat is applied, to form a colored image. The sample supplied us by the manufacturer had a brown image and exhibited fairly good tonality, although the sharpness was not quite as good as would be expected from conventional silver-halide materials. By changing the chemical composition of the base material a great variety of colors is said to be obtainable. As of the present, Calimar is being released in limited quantities for industrial applications testing.

THE OSTER PROCESS. Still very much in the laboratory and a long way from any commercial product, this process is being developed by Professor Gerald Oster of the Polytechnic Institute of Brooklyn, widely regarded as one of the outstanding researchers in photosensitive plastics today.

In Dr. Oster's process, exposure to light instantly changes a liquid plastic (monomer) to a solid plastic (polymer). Development not only requires no additional chemicals, but actually takes place at the time of exposure.

Each of the three preceding processes employs chemicals or group of chemicals

continued on page 118

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Polaroid Films continued from page 60

attainable with Polaroid materials today is the equal of that attainable by any other black-and-white process, and that only the most technically proficient darkroom workers are able to match the brilliance and gradation of prints that are being torn from Polaroid cameras by even the rankest of beginners.

Polaroid films today

Four types of Polaroid film are available today. These are numbered in two seriés to indicate their formats: "30-series" films containing eight 2¾x3½ prints and fitting only the Polaroid Highlander models 80 (discontinued) and 80A (current model). All other films are in the "40-series" which give eight 3¼x4¼ prints and fit any Polaroid camera models except the 80 and 80A. The positive transparency film is the sole exception to this. Available only in the "40-series," Type 46 gives eight 2¼x2¼ transparencies, Type 46-L the same number of 3¼x4¼ slides.

The three Polaroid print films are: Type 41 (and 31 in the smaller wallet-sized format), a medium-speed orthchromatic material designed for general picture-taking; PolaPan 200 (Types 32 and 42), the newly improved high-quality film; and PolaPan 400 (Type 44, not available in the "30" series), a high-speed available-light film.

It is almost impossible to describe the new version of PolaPan 200 without lapsing into superlatives. This is a magnificent material, and quite aside from being the outstanding member of the Land print-film triumvirate it is very obviously one of the finest black-and-white films available today. Twice as sharp as its predecessor, improved PolaPan 200 encompasses an extraordinarily long tonal scale ranging from richly saturated blacks to brilliantly sparkling whites. To be a bit more specific about PolaPan 200 and its two companion print films, let's analyze film characteristics individually.

SPEED: Polaroid Land films are rated in terms of "ASA equivalents," that is, indexes which may be used with ASA-calibrated exposure meters to obtain optimum quality. Because these speed ratings are arrived at very largely through practical picture-taking test methods, they should be treated with a great deal more respect than is generally the case with most black-and-white materials today. The exposure indexes for PolaPan 400 are 400 daylight and 280 tungsten; for PolaPan 200, 200 daylight and 140 tungsten; for Type 41 (and 31) orthochromatic film, 100 daylight and 70 tungsten. In relation to their black-and-white indexes, the tungsten ratings of Polaroid Land print films are somewhat lower than is usually the case with conventional black-and-white negative materials. This is primarily due to the fact that their red-sensitivity (in the case of the panchromatic print-films) is also somewhat lower than normal. The indexes 280, 140, and 70 are not calibrated on most exposure meters and based upon our testing we would recommend the following tungsten-index substitutions: for PolaPan 400, set the meter at 250; with PolaPan 200 use 125; and with Types 31-41 ortho films use 64 with ASA-calibrated meters.

LATITUDE: The Polaroid process is fundamentally similar to the reversal processes employed in positive color transparency films, although the mechanism of reversal is quite different. The basic similarity, however, lies in the use of unexposed silver halides in the negative to form the final positive print image directly. Because of this, the latitude of Polaroid print films more nearly resembles that of color transparency materials than it does that of conventional black-and-white negative films. PolaPan 400, with the lowest over-all contrast, has the greatest degree of exposure latitude. Measured in stops, this is probably equal to about two stops over and one stop under. The latitude of PolaPan 200 is only slightly less, and even about 1½ stops over and a stop under will usually produce acceptable prints.

Because of its extreme contrast, the latitude of Type 31 and 41 orthochromatic rolls is considerably less than that of either of the two panchromatic Land films, and variations or more than about half a stop more or less exposure will almost always produce markedly different results.

SHARPNESS: Although Type 31-41 and PolaPan 400 films represent a great improvement in sharpness compared to the original 1948 Polaroid print film, they are excelled in this respect by the new improved PolaPan 200 film which has approximately twice as much resolving power. The apparent sharpness of PolaPan 200 prints is further enhanced by its remarkable ability to separate very dark subject values and its extreme gradation scale which extends far into what are normally considered highlight areas. When Type 31-41 film is used to copy documents and other originals having high contrast, its inherent contrast offsets its lack of resolving power and extremely sharp copies can be produced with accurate exposures. The potential sharpness of PolaPan 400 may be compared to that of a high-speed black-and-white negative material.

CONTRAST: The three Polaroid Land print films vary considerably in this department with Type 31-41 very definitely on the contrasty side, and PolaPan 400, the high-speed available-light material, almost as definitely in the low-contrast column. Type 31-41 is a popular choice for all-around snapshooting by people who like "snappy" prints and an excellent material for making copies of drawings or printed matter, cloudy-dull landscapes, and other photographic applications in which high contrast is desirable. PolaPan 400, on the other hand, is admirably suited for subjects of more than normal contrast such as the majority of indoor available-light situations, as well as for direct flash pictures. The in-between contrast of PolaPan 200 most closely resembles that of medium-speed negative films in the ASA 64-to-100 rating category and is therefore suitable for use in the overwhelming majority of picture-taking situations.

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Thus far we've been considering the over-all contrast. Also important is gradation, or local contrast, which is a measure of the film's ability to separate similar print densities at both the highlight and shadow ends of the scale as well as within the middle-tone areas. In this regard PolaPan 200 is the obvious winner, and gradation potential is at least equal to that of the best thin-emulsion films.

CONTRAST CONTROL: To a limited extent, the contrast (and gradation) of Polaroid Land print films can be controlled by altering the developing time. Allowing prints to remain in the camera for more than the recommended 60-second processing cycle results in *increased* contrast, while removing the picture before the end of 60 seconds produces *reduced* contrast. If prints are left inside the camera too long, however, dark values in the shadow areas will tend to become excessively black while white highlights (and light-gray middle-tone) areas will bleach to a uniform whiteness. Although over-all contrast will be increased, this will be at the expense of gradation at both ends of the scale. Moreover, extreme overdevelopment may lead to *gilding*, a condition similar to the fogging of a conventional film in which the Polaroid print exhibits an unpleasant gold-cast. Removing the picture too soon, however, will result in mottled prints due to incomplete development of all the silver within the negative and uneven transferal of the negative image to the positive paper.

The advisable processing range for PolaPan 200 and PolaPan 400 extends from a minimum of approximately 45 seconds for contrast reduction to a maximum of perhaps three minutes when an increase in contrast is desired. Cutting below the 45-second mark will very frequently result in a blotchy, partially undeveloped print with extremely flat contrast and poor gradation. In most cases, lengthening the processing cycle to 90 or 120 seconds will produce all the additional "snap" that is desirable. Type 31-41 rolls, being inherently contrastier than either of the PolaPan films, can safely withstand somewhat less development in order to reduce contrast, but unless the original subject is extremely lacking in contrast, there's a danger of excessive highlight bleaching when processing is extended beyond the 90-second mark. The probable safe minimum for these ortho films is not less than 30 seconds.

TEMPERATURE VARIATIONS: Although all Polaroid Land films will produce high-quality prints over a wide range of temperature variations, it should be understood that the 60-second processing recommendation is based upon the assumption that the camera temperature will be somewhere near 72 F. When the camera temperature rises to 100 F, or higher, it is advisable to cut the processing time by about 25 percent, reducing the normal 1-minute cycle to 45 seconds. With temperatures between 72 and 100 F the difference in density is extremely difficult to detect and will probably not be noticed by most photographers.

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to a loss of density there will usually be a decrease in contrast. PolaPan 200 and PolaPan 400 are considerably less subject to low temperatures than is the orthochromatic Type 31-41 material. With a camera temperature of 30 F the 1-minute processing time should be extended to approximately 4 to 5 minutes in order to restore normal print density with only a very slight increase in contrast. Under the same 30 F processing conditions, however, Type 41-31 rolls will require an exposure increase of approximately 6 to 7 minutes and, although this will restore normal print density, the already high contrast of this material will be markedly increased. For this reason it's a good idea to restrict any cold-weather shooting to the two panchromatic films.

The Polaroid transparency system

The Polaroid Land transparency system, which provides positive black-and-white pictures for viewing by projection, represents what many critics have judged to be the ultimate in black-and-white image quality attainable today. The tonal gradation is absolutely amazing, the scale being even longer than that of the improved PolaPan 200, with detailed contrast in the blackest blacks and the whitest whites at either end of the scale. Rated at the ASA equivalent of 1000 daylight and 700 tungsten, they are also the fastest of the Polaroid Land Films and provide effective exposures equal to those obtained with high-speed black-and-white negative materials. Two sizes are available to fit all cameras save the discontinued model 80 and the current model 80-A. These are Type 46 for 2¼x2¼ and Type 46-L for 3¼x4¼ transparencies, with plastic snap-in slide-mounts provided for both formats.

Unlike the print films, Type 46 and 46-L films require a two-minute processing cycle. After exposure the transparencies are air-dried for a minimum of three minutes after which they are immersed in a protective fluid contained in a plastic device called the Dippit for about 20 seconds. The Dippit, which performs the same basic function as the Polaroid print coater, hardens the image and makes it permanent.

The new Polaroid Print Copier

This new device, which attaches to a Polaroid Land camera, provides a ready means of obtaining duplicate prints within minutes after the original was produced and when teamed up with the new PolaPan 200, copies are better than ever.

Housed in a two-tone black-and-gray plastic cabinet which, when closed, resembles nothing so much as a small radio receiver, is a complete copying unit that will handle Polaroid prints or any other original up to 3¼x4¼. A close-focusing (positive supplementary) lens butts up against the camera lens to provide one-to-one copies. (*Actually, in order to produce clean picture borders, the Print Copier lens incorporates a minute magnification.*) The print easel, which may be removed from the unit for cleaning or when copying other material, has a coin-

Print at left, page 61 is copy print

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slotted adjustment screw on its back for centering the easel for individual cameras. The easel is illuminated by two small lamps placed at 45 degrees and covered with polarizing screens to provide perfectly glare-free lighting with even the glossiest Polaroid print. A continuously moving second-timer is located on the top panel for exposure and processing time control.

To set up, the hinged top plate is unfolded, causing the permanently fixed-focus lens to pop forward in its cone, and providing a bed on which the Polaroid camera rests. The camera is positioned simply by first dropping the tripod socket over a small plastic stud on the Copier bed, and then racking the focus forward to the 3½ foot position so that camera and copier lenses make contact. Unless the print is extremely dark, you set EV-calibrated Polaroid cameras at 17, (equivalent to 1/100 second at f/35), and the shutter switch at B, (Bulb). With Pola-Pan 200 film in the camera, and a good-quality original in the copier easel, the average exposure will run to about 7 seconds with 60-second processing. A cable-release included with the copier, and stored in a special well on the top panel close to the timer, makes such long time exposures easy, and prevents camera-shake.

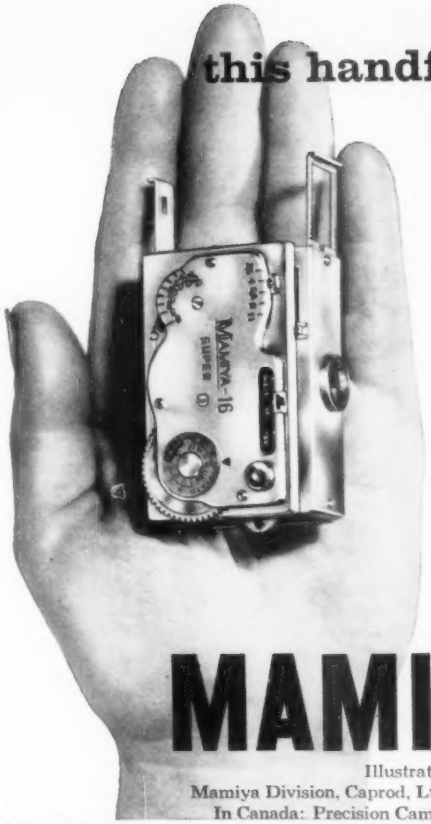
The Print Copier is an impressive proving-ground for the new PolaPan 200; the quality of copies (particularly when the originals also were made on this film) is truly impressive. Frequently it is next to impossible to distinguish between an original and its copy-print. It's even possible to improve upon the quality of the original. Two controls make this possible: (1) exposure time, and (2) processing time. Increasing (or decreasing) the amount of exposure given will effectively lighten (or darken) the copy print in relation to the original. In our tests we found that excellent copies could be made from very dark (underexposed) originals simply by pumping in more print exposure. The contrast of the copy-print may very effectively be controlled by adjusting the processing time. As previously indicated, cutting back to about 45 seconds provides softer contrast, while additional snap may be obtained by increasing the time to 90 seconds or two minutes.

The Polaroid Print Copier is available in the following three models, all priced at $29.95: Model 240 for cameras 95, 95A, 95B, 100, 150, 700, and 800; Model 2401 for cameras 110 and 110A; and Model 230 for cameras 80 and 80A.

How long will they last?

One of the most often-voiced questions about Polaroid Land picture-in-a-minute photography is, "How long will the prints last?" This question, which has its roots in the early days when Polaroid switched from sepia-toned films to black-and-white, and the resulting prints were inclined to fog or fade out, seems in great part to be based on a natural inclination to mistrust anything obtained too easily.

Actually, the fact is that properly coated Polaroid prints will last just about as long as conventional prints (as-



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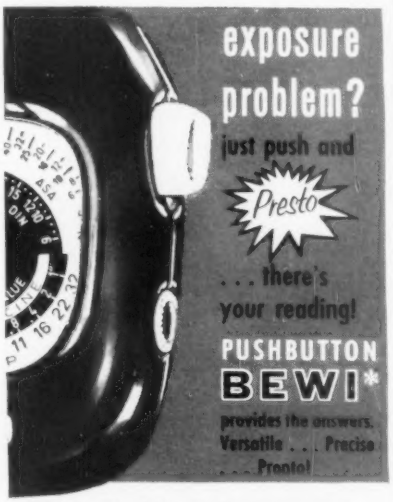

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suming they're properly fixed and washed) subjected to the same conditions. Properly coating Polaroid prints means at least six or eight even strokes with sufficient pressure on the coater to get a liberal dosage of the coating chemical onto the print. In addition to imparting a high-gloss finish, this fluid serves as both mechanical and chemical protection to the print, safeguarding it against contamination by harmful foreign bodies that frequently lurk in the atmosphere, and providing anti-abrasion (and sticky-finger) protection.—

Film Sound with Tape

continued from page 104

also is available. We found that with the mike in a low and central position on the jacket, the general background noise of the street was effectively recorded. This position was necessary to avoid picking up the sound of the recorder and camera motors. If a small amount of this motor noise remained it was drowned out by the background sound of the street.

The background and street sounds came through the earphone with good clarity, even with the volume control turned up to full intensity. A subsequent playback of the tape proved the recorded sound was equal in quality and quantity to that which was monitored.

Next, we turned camera and microphone on a scene involving a group of neighborhood youngsters playing basketball in a school yard. Again, the quality of the sound was accurate.

The next basic situation we experimented with was lip synchronizing. As in any recording situation, outdoors or in, there is a necessity for following the speakers with the microphone so that the sound does not fade in or out as they move. To solve this we decided to rig a simple mike boom. We went directly to Mohawk, where we were advised that microphone cords could be custom-made (yet inexpensively) to any length required. We ordered a 20-foot cord.

With the new cord we were able to attach the microphone to either the boom or floodlights. On the floodlight stand the microphone was out of reach of the motor noises of both camera and recorder. On the boom light reflector an assistant was able to follow the subject with the microphone and keep sound at an even pitch.

Although there are several possibilities for playing the recorded tape during the projection of the movies (there is an accessory phono plug which permits the tape to be hooked up to an amplifier or record player; the recorder has its own microphone), we were mostly concerned with getting the taped sound recorded onto the film. If the film is going to be striped and have sound added before editing, there is no problem here. Make sure the start marks on the tape and on the film are accurate before starting to record. However, if any editing has been done to the film before the recording there is a problem. Cartridge tape cannot be edited for two reasons—the tape is double (like double film, it is used twice) and you can't cut one side without cutting the other, and you can't use the tape again in the Midgetape once it has been removed from the cartridge.

Two ways of getting around this problem are (1) remove the tape and wind it onto a regular tape recorder reel, or (2) transfer the recorded sound to a standard tape recorder. The first is disadvantageous because the tape stretches, although it is a standard-size tape.

Neither of these is necessary if no precision synchronization is required. You can, for ordinary sound effects, mark your tape and start and stop it to suit the projection during the recording session. An instant stop on the recorder makes this comparatively easy.

While the Mohawk Midgetape was not designed primarily for films, many of the accessories can enhance its use for recording movie sound. There is, for instance, a power converter which allows the machine to be plugged into any 110-volt a-c household socket, and which allows the cameraman the freedom from worrying about the battery's going dead during a shooting session. A foot control, intended for secretaries who transcribe from these tapes while typing with both hands, can be useful to the home movie cameraman who might have both hands busy with his camera. This would be applicable when a zoom lens is being used.

Various models of the microphone are concealable, and since the entire machine can be disguised to look like a camera case, it comes in handy for recording sound during surreptitious or candid filming assignments.

The Mohawk people showed us an amateur-made movie in which the lip synchronization was amazingly accurate, and which certainly proved that it can be done if the maker is careful in his recording technique and limits the length of his takes to under about 15 seconds (you will seldom want a shot much longer than that anyway) so that the recorder and camera cannot get too far out of synchronization. You will be aided by the fact that many shots will not require absolute synchronization since you will be showing the face and reactions of the listener and not the person talking.

For other sounds (a parade, background noises, atmosphere such as boat whistles and airplane engines) this system is a natural. The sound is no better, of course, than that obtained through the use of a standard tape recorder, but with all the other paraphernalia a movie maker must carry with him the size and weight of this machine make it a decided advantage to the cameraman who wants to pick up sound during the action. The Midgetape would be particularly useful when making a movie of a wedding or other function at which a good deal of equipment would be conspicuous and bulky.

You don't have to be a hi-fi expert to operate the Midgetape. It runs on transistors, and the only time it's necessary to open the case is to change tape or batteries.

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Are Women Allergic to Photography?

continued from page 72

around to protect her from the camera. She has been able to count on him to load and unload her camera. The passing male would help her in distress, when she forgot where the shutter release was.

However, through the years there have developed a microscopic minority of women photographers who have fallen into odd categories:

The *depend-on-the-druggist photographess*. She considers the druggist to be a noble fellow. He loads and unloads her camera and even develops the film.

The *single-skilled photographess*. Her accomplishment is loading and unloading her own film. But it's what she does to achieve blank film that's really a feat.

There's the *shutter-crazy type*. She puts her camera in gear before her mind. She can't get her eye away from the viewfinder and her finger off the shutter release. She doesn't know what she is doing and her pictures show it.

Today, however, photography is as easy as falling off a log. Remember this is the age of automation. Some cameras think for you and you only "push the button."

There are now highly sensitive films that enable you to take pictures under poor lighting conditions without a flash. You can stop action and you don't have to put your camera away when the sun goes down.

Girls! Ladies! Women! Just imagine being able to show your Girl Scouts pictures of their camping trip. And, wouldn't it be helpful to record in photographs the first fund-raising campaign of the women's club?

Your photographer (husband, boyfriend, brother) isn't always around for the treasured moments of life. What if a child's birthday party falls on a weekday instead of Saturday? Or if you are the only one available to capture the children's delight over the first snowfall?

If you can arrange furniture and hang pictures on a wall you can compose a good picture. You have unconsciously been observing the varieties of light—overhead lighting, sidelighting, lighting from below—so why not play around with light in photography? Your sense of color harmony is evident in your dress and in your home.

All photography takes is getting friendly with a few *f* stops. They will give you the same good results as being friendly with the butcher or the baker. Photography can be as simple as cooking. Just

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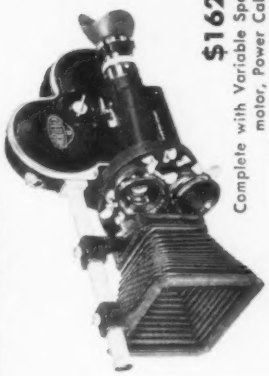

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follow a recipe. With Verichrome black-and-white film, your basic *f*-stops will be 3.5, 8, 11. For indoor black-and-white pictures (Plus-X film), set your camera at 3.5 and the timing of your shutter at 1/10. For shooting in the sunlight, use 11 at 1/100. In cloudy weather, a good setting is 8 at 1/50.

In cooking, if your oven isn't set right, your food will either burn or be undercooked. The same importance should be placed on the setting of your camera. The wrong combination of aperture opening and shutter speed can give you an underexposed or overexposed picture.

Try this photography recipe:

Ingredients:

1 animated child at birthday party
1 camera with Tri-X film
1/50-sec shutter speed
f/3.5 aperture setting
a dash of light from window and ceiling lamp

Procedure: Load camera, set, have ready for shooting. Place child in front of birthday cake, ready to blow candles out. Observe the direction of light on child. Try a few angles, checking for composition, before taking picture. Move in close with camera and focus on child. When child begins to blow candles hold camera steady and shoot; advance film and shoot again, for two pictures are better than one.

Variation: Animated child opening his birthday presents near window, other ingredients remain the same. (For novelty, keep shooting the roll of film, taking pictures of every child enjoying the festivities. Then send him a print for his very own souvenir of the birthday party.)

Once you have soloed with a few rolls of film, you might like to try your hand at developing and printing. This is where the fun really begins. The darkroom, which can be your bathroom, closet, or kitchen, is a creative workshop and you are the experimenter. By cropping various segments of a negative and then enlarging, you will be able to get four or five different-looking photographs. You can make prints of your baby as gifts for the relatives. Or you can show your mother how the newly redecorated room looks.

When you have qualified as an apprentice photographer, you will be able to fill the position of photographer's assistant for your cameraman-husband or boyfriend. There are light meter readings to be taken, and subjects to be arranged. But, your biggest achievement can be getting your *him* in front of the camera.

In the not too distant future I predict that women will be the target of the photographic equipment manufacturer. Cameras will be designed specifically for her. The "feminine cameras" will probably be designed to fit in a woman's pocketbook, or double as a camera and purse. Film instructions will be written in women's language.

If anyone is responsible for women being allergic to photography, it is women themselves. So ladies, take yourself out of exile and make friends with your camera! There's a world waiting for the eye of the camerawoman.—

Photosensitive Plastics

continued from page 111

to produce a single definite physical reaction as an end product. Thus, the Du Pont process produces hardening, the Ferro process produces discoloration, and the Kalvar process produces bubbles.

The tremendous potentiality of the Oster discovery lies in the fact that: (1) By direct optical sensitization, just like the optical sensitization of silver halide materials, it is possible to adjust the sensitivity of the material to other than UV radiation, and to use the visible light spectrum, or parts of this spectrum, as the exposing illumination. The dyes absorb light of their own color, then instigate the liquid-to-solid change in the photosensitive plastic. (2) This general liquid-to-solid reaction can produce a tremendous variety of results: a dark image; a light image; an ink-receptive image against a water-receptive background for use as printing plates in lithography; or an ink-resistant image for, perhaps, a mimeograph-type process, to name a few. (3) In addition, the liquid-to-solid reaction is not necessarily an end product, but itself can be used to trigger an almost limitless variety of additional reactions. Most of these go far beyond the scope of ordinary picture-taking.

Another exciting aspect of this process is that, according to Dr. Oster, "despite its being still in the early development stage, speeds that can be achieved right now are comparable with those of silver halide films."

In response to our question concerning the practicality of an initially liquid process, Dr. Oster replied that if suspended in another plastic, starch, or even animal gelatin, his material would in practice be just as dry as any conventional silver halide film, which is itself a colloidal suspension within an animal gelatin emulsion.

These then, are the four photosensitive plastic processes which are known to exist today. The course of future development in this new branch of "non-silver" photography invites much speculation. Based upon existing products and even later developments being performed in laboratories, the incredible possibilities include such things as a super-speed, super-finegrain self-developing film that would produce finished negatives inside the camera as fast as the film is transported, and the complete elimination of all black-and-white darkroom work.

The armed forces have shown great interest in each of these processes, as they offer their greatest immediate possibilities in fields which vitally concern the military. Photosensitive plastics are completely impervious to killing levels of nuclear radiation, exhibit shelf lives as long as their makers have been in business, do not require running water or a stock of solutions for their development.

We will surely see several of these processes come into use in specialized fields during the next few years. However, though their possibilities are indeed incredible, many obstacles in research and development must be hurdled before we can use them in our cameras.—

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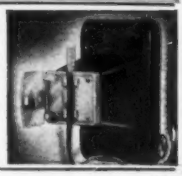

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K-20 with 6¾" f4.5 lens with 6-rolls 5¼" x 20' Super-XX. 2-filters, and case for camera. **79.95**

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For processing of Aerial Film (K-20), 5¼" to 9½" wide x 20' long. Complete with three tanks. Gov't cost $102. **39.95**

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Color • Black & White Guaranteed till March 1959

SIZE	TYPE	QUAN.	PRICE
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120, 620	Infrared 100 ASA	10 rolls	2.69

35mm COLOR

Guar. till March 1959

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16mm x 100' Day. 1958 **4.59 ea.** 3 for 12.99 W/O Processing

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Microfile 35mm x 36 exp. **10 for 1.99**

35mm B & H #71Q EYEMO

3-lens turret outfit

- With 4-lenses: 25mm f2.3; 50.8-mm f2.8; 100mm f2.9; 152.4mm f4.5
- 3-objective lenses: 2", 4", 6". Two 400' mags.

459.

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K-24 Aerial Camera

Brand New—Unused—Guar. Perfect. Complete with 7" f2.5 Kodak Aero Ektar lens, filters and magazine.

+ 6 rolls of 5½" x 26' Super XX film (1957 date) for use with K-24 camera. Gov't cost $529.

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3 stainless steel tanks, reel assembly, self reversing. Motor operates on 110 volts A.C. Film capacity: up to 9½" wide, 200' long. .. only **159.99**

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Positive 35mm x 100'.....1.50
35mm x 100' Day, bulk loader w/12 empty cart. & cans.....5.39

70mm FILM

70mm x 15' Tri-X In orig. Cassette, ready to use 3 for **2.99**

70mm x 100' Plus-X, Tri-X, Sup.-XX **3.49**

70mm x 200' Plus-X, Super-XX.. **6.49**

35mm x 100' new, latest emulsions

Guaranteed till March 1959

- PLUS-X ASA 80
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3.29 each

35mm x 100' Daylight Bulk Loader with 12 empty cartridges and cans.....5.39

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4 x 6	DWSM	250 sh.	4.59
5 x 7	DWGL or DWSM	200 sh.	4.99
5 x 7	DW Silk	100 sh.	3.69
8 x 10	SW Lustre	100 sh.	3.49
8 x 10	SWSM	100 sh.	3.69
8 x 10	SWGL	100 sh.	4.39
8 x 10	DWSM	100 sh.	4.99
10 x 10	SWSM	125 sh.	3.79
9⅝" x 500'	SWSG	1 Roll	10.49

Brand New! POLAROID Cameras

Model #		List Price	Your Price
80A	Camera	72.75	58.49
95B	Camera	94.50	74.49
150	Camera	109.95	86.49
110A	Camera	169.50	119.49
800	Camera	126.00	98.49

ENLARGING PAPER

Guar. till Mar. 1959

KODABROMIDE • HALOBROME • CYKORA

Size	Type	Contrast	Quan.	Price
3½x5	DWSM	#2	500 sh.	4.99
4x5	DWSM	#2	250 sh.	4.99
5x7	DWGL	#2	200 sh.	4.99
8x10	SWGL Lustre	#3	100 sh.	3.49
8x10	SWGL-DWGL	#1	100 sh.	2.99
8x10	SW Res Rap.	#2,3	100 sh.	3.49
8x10	SWGL	#2,3,4	100 sh.	4.49
8x10	SWSM	#1,2,3,4	100 sh.	3.59
8x10	DWSM	#2,3,4	100 sh.	5.49
8x10	SW Brovira	#1	100 sh.	2.29
8x10	SW Portraya	#2	100 sh.	3.99
11x14	DWGL	#1,2,3	50 sh.	4.49
40"x30'	SWGL-SWSM	#1,2	1 Roll	4.49
40"x30'	DWSM	#2,3,4,5	1 Roll	6.99
9⅝"x200'	Res. Rapid	#1,2,3,4	1 Roll	4.89

9⅝" x 200' AERO ENLARGING PAPER #1, 2, 3, 4 — **4.89** — 2 for 8.99 — Case of 20 rolls 85.00

Roll cuts into 240 sheets 8x10.

CONTACT PAPER

Guar. till Mar. 1959

KODAK • HALOID • ANSCO

Size	Type	Contrast	Quan.	Price
4x5	SWGL	#1,2,3,4,5	500 sh.	2.69
5x7	SWGL	#1, 2, 3	200 sh.	3.19
7½x7½	SWGL	#1,2,3	250 sh.	3.89
7x9	SWGL	#3	100 sh.	2.19
8x10	SWSM	#1,2,3,4	200 sh.	3.69
8x10	DWSM	#1,2,3,4	100 sh.	2.69
8x10	SWGL	#1,2,3,4	100 sh.	2.89
8x10	Ad Type	#3,4	250 sh.	3.29
8x10½	Reflex Copy		200 sh.	2.99
10x10	Document	#2,3,4	144 sh.	1.50
10x10	Resisto	#2,3	250 sh.	3.19
11x14	SWGL	#0,1,2,3	50 sh.	1.79
10x20	Resisto	#1,2,3,4	100 sh.	3.29
17x22	Reflex Copy E		100 sh.	6.99
18x22	Ad Type		100 sh.	5.99
8"x300'	SWGL	#2	1 Roll	7.49
9½"x200'	SWGL	#3	1 Roll	4.99

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50 sheets.....7.69

7" Aero Ektar Lens

Coated f/2.5. With click stop diaphragm. Ideal for high speed color. Perfect for 35mm reflex or press use. Gov't cost $485.

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4x 5 Comm'l Ortho	50 sh.	2.99
4x 5 Ansco Color Tung.	30 sh.	2.99
8x10 Contr. Pro. Pan	50 sh.	2.99
11x14 Comm'l Ortho	20 sh.	3.29

Ansco Printon • 1957 Date — 11 x 14 10 sh. **6.95** — Fully guaranteed

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Develops up to 100' of 8, 16 or 35mm film. Uses ½ gallon of solution. FREE: with tank, 6 rolls of 16mm x 50' Blue Base reversal or 3 rolls of 8mm x 25' dbl.

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Brand New Cameras and Equipment

35mm and Reflex CAMERAS

	List	Special
Aires IIIL, with case	112.95	74.99
Konica III, with case	137.25	89.99
Ricoh, with case and flash	59.95	44.99
Yashica "A", w/case	35.95	23.25
Yashica "C", w/case	54.50	36.50
Yashica "LM", w/meter & case	69.95	45.50
Yashicamat, automatic, w/case	85.50	58.50

Revere 8mm Cameras & Projectors

*CA-1, single lens	139.50	104.49
*CA-2, 3-lens turr.	169.50	128.49
*CA-4 Magazine	199.50	149.99
P-777 Projector	127.50	91.49
B & H No. 253A 8mm Proj.	69.95	52.99
Brumberger No. 1503 8mm proj.	45.90	30.99

* All with electric eye

35mm (2 x 2) Slide Projectors

Revere 888		
Brumberger No. 1311	144.50	99.99
Quick Set Super 300	59.50	44.99
Projectors supplied with case	69.95	46.99

Darkroom items and accessories

4x5 E.K. stainless steel hangers (6)	9.60	4.49
11x14 Speed-Ez-Et	7.95	5.95
Hugo Meyer Range Finder	4.95	3.95
Avigo Bounce Flash Gun	9.95	3.99
Weston III Meter, w/case	15.95	11.49
	32.50	22.49

NEW YASHICAS — JUST RELEASED

Yashica 635 Reflex, f3.5, w/case	69.95	45.99
Yashica No. 127 Reflex, w/case	69.95	45.99
Yashica 8mm Model #5, f1.9	49.95	33.99
Yashica 8mm Model 8T, f1.4	79.95	52.99

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8" f5.6 Cooke Aviar	29.99
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Brand New 35mm Cameras

	List Price	Special Price
Agfa Ambi Silette f2.8	129.00	76.50
Aires IIIc f1.9 w/case	123.50	89.50
Aires IIIL f1.9 w/case	112.00	75.50
Argus V100 f2.8 w/c & flash	131.15	98.75
Argus V100 f2 w/c & flash	161.15	120.85
Argus C-3 Matchmatic w/c, f & meter	74.95	56.25
Argus C-44 Rapid wind f2.8 w/c	120.70	99.50
Argus C-44 Rapid wind f1.9 w/c & f	170.70	128.50
Asahi Pentax f2.2 P.S.	195.00	139.50
Asahi Pentax f1.9 P.S., Primoplan		147.50
Canon VT f1.8	333.00	196.50
Canon LI f2.8	259.00	149.50
Contaflex I f2.8	153.00	89.50
Contaflex II f2.8	176.00	103.95
Contaflex III	176.00	124.50
Contaflex IV	199.00	138.50
Contaflex Alpha f2.8	126.00	94.50
Contaflex Beta f2.8	149.00	112.95
Contax IIa f2	298.00	198.50
Contax IIa f1.5	318.00	224.50
Contax IIIa f2	328.00	229.50
Contax IIIa f1.5	348.00	258.00
*Exakta VX IIa f2 Auto		225.00
*Exakta VXIIa f1.9 Auto		239.00
Graphic 35 f2.8 outfit	74.95	54.50
Graphic Century 35 f3.5 w/c	57.00	40.25
Graphic Century 35 f2.8 w/c	72.00	49.95
Kodak Retina Reflex f2 Xenon	215.00	138.50
Kodak Retina IIIc f2 Xenon	175.00	98.50
Kodak Retina IIc f2.8 Xenar	132.00	81.50
Kodak Signet 30	55.00	39.75
Kodak Signet 40 w/flash	62.50	45.95
Kodak Signet 50 w/flash	82.50	57.50
Konica III MFX w/c, Discontinued		78.50
*Leica III G f1.5 Summarit		297.50
*Leica III G f2 Summicron		269.50
*Leica M-3 f1.5 Summarit		372.00
*Leica M-3 f2 Summicron		349.50
Lord IV B f2.8 w/c	68.90	47.50
Lord VD f1.9 w/c	110.45	76.50
Minolta A f3.5 w/c	57.90	40.25
Minolta A-2 f2.8 w/c	78.90	53.75
Minolta Super A f2 w/c	141.45	97.75
Minolta Wide f2.8 w/c	99.50	71.50
Mamiya Magazine 35 f2.8	89.50	***
Miranda f1.9	199.50	134.50
Miranda A f1.9 Auto	259.50	179.50
Olympus 35 SII f2.8 LVS w/c	89.95	***
Olympus 35 SB f1.8 LVS w/c	124.50	***
Petri f1.9 w/c	92.00	61.50
Praktica FX 3 f2.8 Auto Westanar	149.50	***
Ricoh 519 f1.9 w/c & meter	114.50	79.50
Ricoh 500 f2.8 w/c	79.95	55.25
Robot Star f1.9		89.50
Samoca 35X w/meter & case	47.90	33.35
Samoca 28X w/meter & case	57.90	40.25
Vitessa L f2	159.50	96.50
Vitessa T f2.8	154.50	92.70
Vitessa N f3.5	99.50	59.50
Walz 35 f1.9 w/c	112.00	80.50

*Display Models.

Brand New Reflex Cameras

Hasselblad 500 C f2.8 Auto	480.50	
Ikoflex Favorit w/c	224.00	122.85
Ikoflex Ic f3.5 Tessar w/c	160.00	67.50
Kalimar Reflex f3.5 w/c	112.00	79.75
Kalloflex f3.5 w/c	131.00	91.50
Minolta Autocord	109.45	74.75
Minolta Autocord L w/c	135.45	93.50
Super Ricohflex f3.5 w/c	24.95	18.50
Ricoh Diacord G w/c	56.50	39.50
Ricoh Diacord L w/c	75.00	51.75
Rolleicord VA f3.5 w/c	114.50	***
Rollei 4 x 4 f3.5 w/c	149.50	***
Rolleiflex f3.5 G Xenotar w/c	216.95	***
Walzflex 500 w/c	59.95	41.50
Yashica A w/c	35.95	23.95
Yashica C w/c	54.50	36.50
Yashica LM w/c	69.95	45.50
Yashicamat w/c	85.50	58.50
Yashica 44 w/c	69.95	49.95
Yashica 635 w/c	69.95	49.95

Brand New Tape Recorders

Ampro 758	249.95	179.50
Bell & Howell Stereo 771	199.95	***
Revere T 700 D	225.00	162.50
Revere T 1120 Stereo	199.50	139.50
VM Tape-O-Matic 710	189.95	137.50
VM Tape-O-Matic 714 Stereo	225.00	163.50
Wollensak 1500	199.50	136.50
Wollensak 1515	229.50	163.50

Brand New 8mm Cameras

	List Price	Special Price
Bauer 88 B	149.50	108.50
Bauer 88 E	169.95	121.75
B & H Electric Eye f2.3	99.95	***
B & H Electric Eye f1.9	119.95	***
B & H Electric Eye Turret f1.8	159.95	***
B & H 252 Turret f1.9	84.95	***
Canon 8T f1.8	159.50	109.95
De Jur Versadial	99.50	69.50
Keystone K-48 Turret f1.9	139.50	93.50
Keystone K-27 Turret three f1.9 lenses	99.95	67.50
Kodak Brownie f2.3	29.95	22.50
Kodak Brownie Turret f2.3	59.50	43.25
Kodak Brownie Turret f1.9	74.50	54.50
Kodak Medallion 8 Turret f1.9	144.50	94.50
Revere CA-1, E.E. f1.9	139.50	103.65
CA-2 E.E. f1.9 Turret	169.50	126.50
CA-3 E.E. f1.9 Mag.	169.50	126.50
Revere CA-4 E.E. f1.9 Mag. Turret	199.50	149.50
Wollensak 42 D f1.8	69.50	49.50
Wollensak 43D f1.8 Turret	99.50	69.50
Wollensak 72 f1.8 Mag.	99.50	69.50
Wollensak 73 f1.8 Mag. Turret	149.50	103.50
Wollensak 23 Bi-lens Turret Mag.	239.50	172.50
Wollensak 28 f1.9 Mag. Foc.	139.50	97.50
Wollensak 53 3 lens Turret Foc.	199.50	139.50
Wollensak 58 f1.9 Foc.	124.50	87.50
Wollensak 47 f1.8 Electric Eye	94.50	71.50
Wollensak 46 f1.8 E.E. Turret	144.50	108.50

Brand New 8mm Projectors

Bauer T-10	179.95	127.95
Bell & Howell 353 Autoload	129.95	***
Brumberger 300	39.95	28.50
De Jur 500	69.95	48.95
De Jur 750 w/c	166.00	114.95
De Jur Custom 1000 w/c	179.00	126.50
Keystone K-100 500 w/c	99.95	72.50
Keystone K-105 750 w/c	149.50	99.95
Keystone K-109-D 750w/c	174.50	121.95
Kodak Brownie 300	64.95	46.75
Kodak Brownie 500	79.50	57.50
Kodak Showtime 500	123.50	84.75
Kodak Showtime Variable	139.00	96.75
Kodak Showtime 750W Variable	174.50	126.50
Revere 777 750 w/c	127.50	91.50
Revere 85X	114.50	73.85
Revere 90X	125.00	86.50
Wollensak 18 w/c	169.50	119.50
Wollensak 715 w/c	162.50	114.50

Brand New 16mm Cameras

Bell & Howell 70 DR f1.9	385.50	***
Bell & Howell 200 EE Electric Eye f1.9	329.95	***
Keystone A-O f2.5 Roll	119.50	84.50
Keystone A-12 f1.9 Turret Roll	169.50	113.50
Keystone K-51 Mag f2.5	150.00	104.50
Keystone K-56 Mag. Turret f1.9	200.00	138.50
Kodak Royal f1.9 Ektar	198.00	143.50
Kodak K-100 f1.9 Ektar	299.00	223.50
Kodak K-100 Turret f1.9 Ektar	337.00	249.95
Revere C-101 Roll film f2.5	169.50	118.95
Revere C-103 Turret f1.9	224.50	154.50
Revere C-36 Mag f2.5	169.50	118.95
Revere C-39 Mag Turret f1.9	224.50	154.50
Wollensak 91 Mag f1.9	187.50	129.75
Wollensak 93 Mag Turret w/3 lenses	287.50	198.75

Brand New 16mm Projectors

Ampro Stylist Deluxe	419.85	299.50
Bell & Howell Statesman	219.95	***
Bell & Howell 385C Sound	499.95	***
Keystone K-16 M w/c	179.50	126.95
Kodak Royal w/c	295.00	219.75
Kodak Pageant Sound	429.00	319.50
Revere 88X	160.00	109.50
Revere SP16 Sound w/c	325.00	241.50
Wollensak 65 w/c	199.50	137.50

Brand New Lenses for Contax & Nikon

21mm f4.5 Biogen	199.50	146.50
35mm f3.5 Soligar	64.95	48.50
35mm f2.8 Biogon	166.00	121.50
35mm f3.5 Zeiss Planar	102.00	74.50
35mm f2.5 Tanar	79.50	53.50
85mm f4 Triotar	106.00	78.00
85mm f2 Sonnar	189.00	138.50
135mm f4 Sonnar	146.00	109.50
135mm f3.5 Soligar	74.95	54.50
135mm f3.5 Tanar	79.50	54.50

Brand New Slide Projectors

	List Price	Special Price
Ansco Dualet	39.95	28.95
Argus 300	39.50	28.75
Argus 300 Auto w/c	59.50	43.50
Argus 500 Auto w/c	69.50	52.50
Argus 500 Electro	99.50	73.50
B & L Balomatic 500	149.50	103.50
B & L Balomatic 300	84.50	58.75
Bell & Howell Robomatic 750 w/c	169.95	***
Bell & Howell Headliner Duo 708	49.95	***
Brumberger Riviera Duo 300	59.50	41.50
Brumberger Deluxe 500 Auto	69.50	48.50
Graflex Constellation 500 Remote	89.75	62.50
Keystone K-500-D	109.95	78.50
Keystone K-510	124.50	86.50
Kodak 300 Readymatic	64.50	46.50
Kodak 300 Auto	74.50	54.50
Kodak 500 Auto	84.50	62.50
Kodak Cavalcade Auto	149.50	109.50
Revere 553—500 W Semi w/c	79.50	55.75
Revere 555—500 W Semi w/c	89.50	62.50
Revere 888 D—500 W Auto w/c	159.50	111.50
Viewlex Powermatic 500 w/c	119.50	83.95
Wollensak 815—500 W Auto w/c	149.50	104.50

Brand New Movie Lenses

8mm

6.5mm f1.8 Elgeet	39.95	27.50
6.5mm f1.4 Walz	69.95	45.95
6.5mm f1.8 Wollensak	60.95	47.50
6.5mm f2.3 Wollensak	45.05	32.75
38mm f1.9 Kinotel	39.95	19.95
38mm f1.8 Elgeet	39.95	27.50
38mm f2.5 Wollensak	57.75	43.50
38mm f1.5 Wollensak	67.50	51.50
45mm f2.8 Xenar	59.95	43.85
75mm f3 Elgeet	49.00	36.95

16mm

9.5mm f2.2 Angenieux	99.50	68.50
12mm f1.2 Elgeet	129.50	99.75
12.7mm f1.5 Wollensak	132.50	103.25
13mm f1.5 Elgeet	95.70	71.95
15mm f1.5 Berthiot	150.00	74.95
51mm f1.5 Elgeet	88.95	67.50
75mm f3.5 Steinheil	29.95	19.95
75mm f2.8 Wollensak	68.50	51.50
152mm f3.8 Elgeet	97.50	73.25

Brand New 35mm Lenses for Exakta

28mm f3.5 Angeniuex P.S.	120.00	86.50
35mm f3.5 Soligar P.S.	74.50	53.50
35mm f2.5 Angenieux	99.50	71.50
35mm f2.8 Votar P.S.	99.50	54.50
35mm f3.5 Travegon Auto	99.50	54.50
35mm f2.8 Schneider Curtagon Auto	149.50	109.50
40mm f3.5 Steinheil	54.50	28.50
40mm f3.5 Macro Kilar E	89.95	61.50
40mm f4.5 Isagon	54.95	39.50
40mm f2.8 Macro Kilar D	139.50	104.50
100mm f2.8 Trioplan	75.00	57.50
100mm f4.5 Westar	44.50	19.95
135mm f3.5 Elite P.S.	79.50	39.95
135mm f2.8 Auto Quinon	189.50	138.50
135mm f3.5 Telexenar Stopomatic	99.50	79.95
135mm f3.5 Travenar Auto P.S.	89.95	49.50
135mm f4.5 Travenon	49.95	29.50
200mm f5.5 Telexenar P.S.	99.50	71.50
360mm f5.5 Telexenar P.S.	189.50	143.50

Brand New Lenses for Leica & Canon

25mm f3.5 Canon	175.00	124.50
28mm f3.5 Canon	145.00	103.50
28mm f3.3 Berthiot	99.50	77.50
35mm f1.8 Canon	160.00	114.50
35mm f2.8 Xenogon	89.95	66.50
35mm f3.5 Koumar	79.50	39.50
35mm f3.5 Soligar	64.95	48.50
50mm f1.2 Canon	250.00	165.00
85mm f1.5 Canon	250.00	174.00
*85mm f1.9 Canon	180.00	127.50
85mm f2.8 Travenar	89.95	54.50
135mm f3.5 Telexenar	114.50	82.45
135mm f3.5 Travenar	86.95	52.50
135mm f4.5 Travenon	59.95	36.50
400mm f4.5 Canon w/Ref. HSG	471.00	338.50

Brand New Electronic Flash

Braun Hobby AM	74.50	54.50
Heiland V 11—Discontinued		34.50
Heiland 64 A	49.95	37.50
Heiland 64 B Transistor	59.95	43.50
Mecablitz 100 Transistor	49.50	36.50
Ultrablitz Jet II	69.95	48.50
Ultrablitz Rocket WL	124.95	62.50
Ultrablitz Matador	99.50	49.50

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f1.9 Lenses complete with auto meter control

	List	New Spec.
Wollensak 27 Roll	94.50	74.50
Wollensak 46 Turret	144.50	108.00
Keystone KA3 Turret	144.50	110.00
Revere CA-1 Roll	139.50	104.50
Revere CA-2 Turret	169.50	131.00
Revere CA-3 Mag	169.50	131.00
Revere CA-4 Turret	199.50	134.00

Latest **YASHICA CAMERAS**

	List	New Spec.
Yashica A	29.95	22.75
Yashica C	46.50	34.95
Yashica LM	59.95	45.95
Yashicamat	75.50	55.50
Yashica 635	69.95	52.00
Yashica 44	53.95	44.95

TAPE RECORDERS
New 2-speed Recorder push button speed change control, dual track recording. Weighs 15 lbs. Up to 2 hrs. recording time.
MINIFILM SPECIAL - ONLY **64.00**

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Wollensak 1500	137.00
Revere T1100	123.00

8mm ZOOM LENS OUTFIT
New Nominar, zooms from ½" to 1½". Fast F2.8 coated optics, focuses from 5 ft. to infinity. Carrying case. Wide Angle supplement, makes it an 8mm lens. Complete with Skylight filter.
SPECIAL **89.50**

8mm MOVIE LENSES
Standard "D" Mounts
SPECIAL **4.95**

1½" F2.5 Telephoto fm	11.50
2mm F2.5 Wide Angle ff	11.50
FOR BOTH - Only	**19.95**
1½" F1.9 Telephoto fm	15.95
6½mm F1.9 Wide Angle ff	15.95
FOR BOTH - Only	**28.95**

Save on Brand New discontinued GOLD-E MANUMATIC slide projector
300 Watt, blower cooled. With stacking slide carrier keeps slides in proper order without the use of magazines. Original list — 58.50
ONLY **29.95**

35mm CAMERAS

Argus C-4, cc, ff	80.00
Olympus 35-S, F1.8	84.00
Olympus 35-SD, F2.8, cc	84.75
Aires III L, F1.9, cc	79.95
Aires IIIc F1.9, cc	92.00
Contaflex I, F2.8	95.00
Contaflex II, F2.8	117.00
Minolta A, F3.5	36.00
Minolta A, F2.8	49.95
Minolta Super A, F2	83.00
Minolta Auto Wide, F2.8	68.50
Miranda, F1.9	119.50
Kodak Signet 30	41.00
Kodak Signet 50, ff	59.50
Exakta VX F2 Auto Biotar	198.00
Exa, F2.8	54.00
Ricoh 500, F2.8	52.00
Ricoh 519, F1.9	74.00
Vitessa T, F2.8	81.50
Vitessa L, F2	92.00
Praktica FX3, F2.8	99.50
Lordomat C35, F2.8	69.99
Lordomat C35, F1.9	84.95

2¼sq. REFLEX CAMERAS

Ricoh Diacord L	49.00
Ricoh Diacord G	35.00
Kalimar 66	74.00
Kalloflex	89.00
Minolta Autocord	69.50
Minolta Autocord L	89.50

ELECTRONIC FLASH

Ultrabits Jet	39.50
FR 140	21.95
FR Model III	36.95
Heiland G4B	44.95
Heiland G4A	39.95

8mm MOVIE CAMERAS

Brownie F2.3	27.50
Brownie F1.9	29.95
Brownie Turr. F2.3	44.00
Brownie Turr. F1.9	55.00
Kodak Medallion Turr. F1.9	118.00
Yashica 8, F1.9	38.00
Yashica 8T, F1.4	59.95
Wollensak 430, F1.9	71.50
Delur Elect. Turr. F1.9	112.00
Keystone K27, Turr. F1.9	68.50

8mm PROJECTORS

Delur Eldorado	79.00
Delur 750	104.50
Revere P777, cc	91.00
Revere 850, cc	86.50
Revere P90, cc	109.00
Wollensak 18, cc	123.00
Wollensak 715	118.00
Kodak Brownie 300	46.95
Kodak Brownie 500	57.95
Keystone K75	57.50
Keystone K100	73.00
Keystone K105(A)	103.00
Keystone K109(D)	127.00

SLIDE PROJECTORS

Ansco 300 Dualet	29.50
Argus 300 Std.	29.50
Argus 300 auto	46.95
Kodak 300	47.00
Kodak 300 auto.	56.00
Kodak Cavalcade 500	112.50
Realist 400	16.50
Realist 400 auto.	22.50
Revere 503	44.95
Revere 505	51.00
Viewlex Powermatic	84.00
Keystone K300	52.00
Keystone K500 (D)	79.00
TDC 7065 cc	46.50
TDC Duo 300	98.00

cc—case ff—flash

SAVE MORE THAN 50%
Brand new LORDOMAT Standard F2.8 ctd. lens, cpld. RF, Pronton SVS shutter 1 to 1/300 sec., MX Synch. Self-timer, rapid wind. Fully INTERCHANGEABLE LENS.
List 99.50 SPECIAL **47.95**

NEW LEOTAX MODEL F
50mm F2 Ctd. Lens. Built-in Synch. 1 to 1/300 Sec. Coupled Rangefinder.
BRAND NEW **114.50**
Everoady Case. $6.00 LIST 260.95

KODAK RETINA IIIc
F2, ctd. Cpld. RF, MX Synch. 1 to 1/500 sec. Rapid wind. LVS, built-in Exposure meter.
BRAND NEW **98.50**
CASE 10.00

85mm F4 Longar Tele 54.00
35mm F3.4 Curtar WA 41.00
Complete outfit: Retina IIIc, case, flashgun, Longar and Curtar **199.50**

RETINA REFLEX
50mm F2 interchangeable lenses, auto diaphragm reflex finder, 1/500 sec. MX, self-timer, built-in exposure meter, auto shutter cocking and film advance. Reg. Val. 215.00
BRAND NEW **138.00**
Case 10.00

USED **LEICA, CANON, NIKON CAMERAS**

Leica III F, F2 Summicron	172.00
Nikon S2, F1.4 Nikkor	179.00
Canon VI F1.8	179.00

Write for other combinations and accessories. New or Used.

CONTAX & NIKON Owners!
CANON, Leotax and other threaded cameras! Rangefinder Cpld. Lenses

135mm F3.5 Telephoto lens	49.95
Finder	2.95
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Finder	3.95

Combination Price for both the 135mm & 35mm lenses **89.95**

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Brockway S and case	21.95
Weston III and case	21.95
GE Golden Crown and case	24.95
Norwood Super Director & case	15.00

PENTACON
with Import Certificate and guarantee cards with F2 Westagon fully Automatic Lens
ORIGINAL LIST 259.50
BRAND NEW **119.50**
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New **8mm MOVIE OUTFIT**
New Kodak Brownie Turret camera with 3 (f1.9 lenses). New Brumberger 300 Watt Projector and case. 30 x 40 Tripod Screen Deluxe leather Gadget Bag
Reg. 154.65 SPECIAL **89.50**

For the PROFESSIONAL! *BRAND NEW* **CROWN GRAPHIC 4 x 5**
with Graphic RF, 135mm F4.7 Schneider Xenar in Compur MX Exakite field lens. Complete with 6, LISCO cut film holders, case Heiland Flashgun, Shade and 3 filters. **280.95**
Camera alone 230.00

TELE VOTAR - PIESKER
Accessory Lenses for Your Camera — Exakta, Praktica, Praktina, Pentacon, Hasselblad, 16mm C mt. Pentax, Miranda and others. Complete with the mount of your choice.

135mm F3.5 Preset	29.50
180mm F5.5 Preset	38.75
400mm F5.5 Preset	95.75
400mm F4.5 Preset	179.00

New! **FEDERAL ENLARGERS REDUCED**

	Reg.	Spec.
Federal 135 F4.5	54.95	38.50
Federal 240 F7.9	29.95	21.50
Federal 290 F6.3	43.95	34.00
Federal 450 F4.5	119.95	84.00
Federal 470 F4.5	142.95	104.00

NEW! **ROYAL 35mm**
F2.8 Color Corr. Lens Cpld. Luminous field Range-View fdr. 1 to 1/500 Sec., MX Synch. Self-Timer, Rapid film advance, Rapid Rewind and built-in electric DUAL RANGE EXPOSURE METER.
ONLY **49.95**

Chrome Trimmed leather case	5.95
Same with F1.9 lens	59.95

New **SUB-MINIATURE 16mm Still Cameras**

Steky III camera F3.5 lens, case, filter and lenscap	**17.95**
New Rush 16 camera and case. Reg. 39.95	**29.50**
New Minolta 16 camera, case 2 close-up lenses. Reg. 39.95	**29.50**

DEMONSTRATOR 35mm MIRANDA REFLEX CAMERA
The MIRANDA camera was designed to give complete versatility to the advanced amateur or professional. Permits the use of lenses and accessories of the Exakta, Praktica, Contax S, Pentacon at all distances and with Leica, Nikon, Contax II for close-ups. Complete with:

- 50mm F1.9 preset lens
- Focuses down to 16"
- Bright pentaprism finder (interchangeable)
- Synchronized, flash and strobe
- Speeds 1 Sec. to 1/500 Sec.

DEMO **119.50**
MINIFILM SPECIAL
List 199.50 CASE 9.50
* complete with Mfgrs. Guarantee and registration

EXCLUSIVE!
The only fully automatic Twin Lens Reflex camera with f2.8 lenses selling under 200.00 — THE NEW WEST GERMAN . .
ROLLOP
79.50
Compare these Features:
F2.8 coated color corrected lenses
Prontor LVS Shutter 1/300 second
Split Synchronization, Self-timer
Sportsfinder, Rangefinder
Plus—Double exposure prevention
Film minder, depth of field scale
WITH FREE Leather Everoady Case

BRAND NEW LATEST MODEL EXAKTA VXIIa CAMERA
with:

- Pentaprism rfdr. Viewfinder
- F2 fully Automatic Westagon lens (Discontinued)

Original List 339.00
SPEC. **219.50**
MINIFILM SPECIAL
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SAVE UP TO 40%
On Kodachrome, Ektachrome, Anscochrome and Super Anscochrome Film. All Factory Fresh Reloads with
PROCESSING INCLUDED IN PRICE
Daylite, Type F, Type A

Film Type	35mm	2 rolls	10 rolls
Kodachrome	20 exp.	8.50	20.39
Anscochrome	36 exp.	10.49	31.75
Ektachrome	20 exp.	7.79	24.79
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It is a well known fact that UNIVERSITY CAMERA sells factory boxed camera equipment at tremendous discounts; obviously, certain factory boxed equipment is returned for concealed damages during the year (which of course, is not our fault, you'll agree . . . however, we repair or replace it at no charge).

We take tally of these products, then, we advise our clients not to buy those which are consistently defective.

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KODAK CAVALCADE

Fully Automatic

w/Remote Control Cord

• Pop Free • w/case • Turbo cooled, 500 Watt • No Flash between Slides • will work with frayed or bent slides every time • Editing ejector lever, lets you switch slides mid-show • Reverses slides • 4, 8, 16 sec. time intervals

List 149.50 — Spec. New **114.95**

MODEL "E" Foto Larger

- Four parallel rigid arm construction Two coil counter-balance springs.
- All negatives from 35mm to 2¼x3¼ size.
- Bellows, fine rack and pinion focusing.
- Cool Aluminum Lamphouse.
- Rotating, Glassless, negative carrier.
- Holder for Varigam.
- 360° tilt.
- 2" forward extension for extreme cropping.
- 16x19 Extra thick baseboard.

Model "E" without lens.....$39.95
New, Special $26.92
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BATTERY OPERATED

35mm Slide Viewer

w/push button

List 7.95 Special **4.62**

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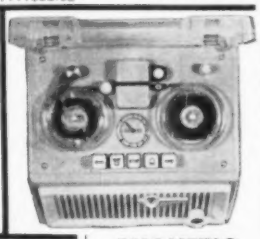
35mm Enlarger

w/bellows focusing
w/ f/3.5 Steinheil lens
List 59.95; Special, new,

33.59

Includ. lens



DARKROOM ACCESSORIES

BRAND NEW

	List	Sale
Yankee Lordomat 20 Tank	10.95	7.25
Yankee 4x5 Utility Tank	3.95	2.92
Yankee 4x5 Agitank cut film	8.95	6.95
Yankee Safe lite w/3 Filters	4.95	3.89
Airequipt 4 Way Fixed Easel	8.95	5.65
Airequipt Dialmaster Easel 11x14	19.95	11.95
Airequipt Photocrat 4x5 Printer	16.95	9.95
Airequipt. Jr. Printer 4x5	12.95	7.95
Brumberger 5x7 Adj. Metal Printer	24.95	17.69
Brumberger 5x7 Safe Lite OA	5.95	4.35
Brumberger 8x10 Paper Safe	13.95	9.37
Brumberger 11x14 Paper Safe	24.95	17.69
Fedco Focus Rite Enlarging Aid	2.25	1.75
Fedco No. 100 Dryer 111/2 x15	9.95	6.75
Gra Lab #168 Luminous Timer	24.95	17.20
Premier A2 Roto Dryer 24x28"	49.95	33.95
Premier A1 Roto Dryer 12x29"	27.50	18.95
Staticmaster 1" Brush	4.95	3.50
Spot-O-Matic Enlarging Meter	15.00	10.97
Nikor 35mm Tank single reel	8.95	6.75
Nikor 120-620 Tank w/Reel	9.95	7.49
Nikor 20 Exp. 35mm wide space reel	4.95	3.89
Nikor 36 Exp. 35mm wide space reel, or 620, 120, 127	4.95	3.89
Nikor #33 Tank with 2 35mm reels	12.95	10.77
Kodak Timer Minutes & Seconds	10.50	8.25
Kodak 35mm Day Load Tank	9.95	7.49
Morse G3 35.8 16mm Dev. Tank	34.00	26.69
Kodak Automatic Tray Siphon	4.95	3.79
Sun Ray 11x14 Metal Adj. Easel	7.75	5.49
Sun Ray 8x10 Metal Adj. Easel	5.50	3.95
Carr Cut Film Hangers 4x5	1.20	.81
Foot Switch, Kriser	8.50	6.45
BFI Chemicals 7 Minute Processing Kit	23.75	8.95
Arkay 16x20 Loadmaster Print Washer	89.50	69.89

PHONETIC Dictating Machine

1⅞, 3¾ Speed, Standard Tape. 60 cycl. 110 AC. Special price only **158.72** including case, mike, tape and phonetic Recorder. Send for Free literature. Camera Trades acceptable

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Vitessa T F2.8	91.50
Vitessa L F2	89.50
Ambi Isolette	76.50
Minolta 16	29.98
Exakta IIA Auto Blo	215.00
Exakta IIA Auto Xen F1.9	219.00
Exakta VX Body	127.50
Rolleicord V	79.50
Exa F2.9 Pre	57.00
Exakta IIa Body	129.50
Petri F1.9	52.00
Petri F2.8	36.50
Petri Case	8.92

SUNRAY Enlargers

NEW

Arnold D w/lens 92.50. Special 59.75 2¼x3¼
Zenith 35mm w/lens. List 79.50. Special..... **52.50**

Mastercraft "23" w/ lens. List 52.50. Special 34.50.

SPECIFICATIONS

• F2.8 color lens • Brite Luml frame • Single stroke rapid wind • Ful sync self-timer • Coupled range finder • 1 sec to 1/500

List 69.50

$38.39

OPTIKON 500 Leather case list 12.50 Special 4.62

10 day trial Full Refund

New 1958

Retina IIIC with built-in 35-80 optical viewfinder (eliminates use of additional finders), newly designed one-scale exposure meter, coupled R.F., Xenon F2 coated lens, Compur MXV shutter, LVS, rapid wind lever; lists 175.00; special..... **118.50**

Retina IIIc same as above, without built-in 35-80 viewfinder. New Special..... **99.50**

Same for Retina IIc—89.50

NORWOOD

Super Director w/case, Strap, valve, grid. Special New..... **17.22**

Bewi Automat B 21.92
Bewi Automat C 16.73

8 Section Metal Elevator Tripod w/Pan Head

Size approx 14" to 5' list 18.95 net **8.92**

Leather Case 99c

#888 5 sec. chrome, non elevator, no pan head, 12" opens to 52". Special **4.92**

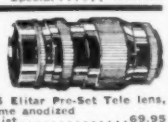
BROWNIE TURRET

NEW

w/3 f/1.9 lenses List $74.50; Special **53.72**

Same w 3 f/2.3 lenses List $59.50; Special..... **42.22**

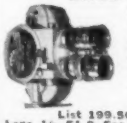
For Exakta Fans



135mm f/3.5 Elitar Pre-Set Tele lens, Black & chrome anodized

Focus Mt. List	69.95
Special, New	24.92
Leather case	6.92

EMEL C93A



- 5 speeds
- Lap Dissolve rewind
- Auto motor
- Lock Turret
- Trigger Button
- Zoom Finder
- Parallax Corr.
- Single Frame counter
- "D" mounts

List 199.50 Body only

Lens 1/2 F1.9 Foc.	$ 39.95
Special w/ F1.9	149.50

BRAND NEW BUYS

Latest Models

	List	Sale
Praktica FX3 w/auto f2.8 lens	$179.50	$114.70
Praktica FX3 w/f2.8 Westanar auto	149.50	97.70
Praktina FX F2 Bio Auto	299.50	199.50
Praktina FX F2.8 Tess Auto	.....	163.20
Edixa Reflex w/F2.8 Schacht Travenar Automatic w waist Level	199.50	117.50

Write For FREE Literature. 10 Day Refund.

RETINA REFLEX

Brand-New 1958 Autom. with Xenon F2, built-in lightmeter, coupled to LVS; autom. diaphragm control split-image rangefinder, built-in self-timer, L.V.S., rapid winder MXV shutter. List $215.00; special $149.50; case list $15.

Spec.—New, w/case..... **148.50**

Trays For All PROJECTORS W/COVERS

28c ea.

Except Revere or B&L

Wollensak electric eye 8mm roll F1.8 84.00
Turret F1.8, 3 lens 108.00
Revere Elect
CA1 ..... 99.50
CA2 .....126.92
CA3 .....128.92
CA4 .....149.50

Brand New R.F. Pentaprism for Exactas, V, VX, & Exas, split image rangefinder combination with viewfinder. Complete with extra ground glass. List 80.00 Brand New 18.98 Case..... .99

Photo-Electric EXPOSURE METER WITH BOOSTER

Complete ASA index, Lens stops F.1 to F.32, shutter speeds 30 sec. to 1/1000 sec. Complete with Booster, Leather case and Strap.

Reg. $12.95

$6.75

SPECIAL! BRAND NEW! WOLLENSAK 8mm TURRET

Model '43' Movie Camera with F1.9 Ctd. Raptar, 9mm W.A., 32.5mm Tele Elements!

List 99.50! Discontinued

ONLY $61.72

Latest 43D Spec. 71.70

AKAREX III w/F2 XENON

German Precision

- Full Sync MX
- Col RF
- Rapid Wind
- Sync Comp.
- Interchangeable
- Parallax Cor.

List 139.50

Brand New **74.50**

Akarex III w/F3.5 Xenar List 99.50 Brand New **59.70**

BRAND-NEW for Leica Fans

135mm f/3.5 Telephoto lens, Rangefinder. Coupled. Chrome Finish List 79.50 Sale NEW **38.95**

Same for Leica M-3..... 44.50

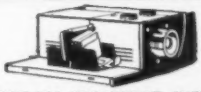
AIREQUIPT MAGS

	New	Our Price
	$2.25	$1.49
Trays for Revere Automatic Proj.	1.45	.79
Case (holds 30 Airequipt mags)	15.95	7.49
Case (holds 12 Airequipt mags)	9.50	3.95
Case (holds 12 Revere mags)	11.95	5.49
Case (holds 30—6" LaBelle trays)	15.95	7.95
Case (holds 24 trays for Revere, TDC, Airequipt, Viewlex)	13.95	6.87

MODEL 2700 Superpod

Geared for quick action raising and lowering
Extra 90 Degrees tilt on panhead
Ball Level on tripod
Ratchet to prevent camera from falling
Degree marks for vertical pictures
Adjustable camera screw

List 22.95 **11.97** Case list 5.95 Special 2.92



KODAK 300 PROJECTOR (NEW)

List 74.50 with Airequipt changer, Spec. w/c, new..... **53.92**

List 64.50 with Readymatic changer, Spec. w/c, new..... **46.92**

KODAK CAVALCADE

500 w. remote, Autom. 149.95 **114.95**
Kodak 500, Auto. 74.50 **55.00**

TRIPODS on Special & Brand New

STAR D CONQUEST (elevating type)	21.00	12.95
Quickset Champ II	34.00	22.93
DELUXE TRIPOD CASE	5.95	2.95
Star D Cont Mark III	25.95	16.75

8mm LENSES

1½" f/1.9 foc. tele	38.75	12.95
1½" f/3.5 FF (Chrome)	19.95	6.25
1½" f/1.4 foc. tele.	69.50	19.95
6.5mm f/1.9 W/A	49.50	17.50
15mm f/1.9 foc. W/A	59.95	32.50
13mm f/1.5 foc. W/A	89.50	46.50
3" f/1.9 foc. Tele	59.95	28.95
3" f/1.5 foc. Tele	89.50	46.50

MOHAWK MIDGETAPE POCKET RECORDER

Battery operated 3⅞" in width, 8½" in length, lightweight. 1 hour recording. A must for business execs., sales managers, reporters, radio, TV, on-the-spot interviews, insurance investigators, etc.

Trade-ins accepted. Free Literature.

List 249.50 Special Brand New **$159.50**

Incl. bat. mike, earphone & tape. Send for free Brochure.

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SUPER ANSCOCHROME ASA 100

High Speed—1959 Date
Orig. Factory Packed

35mm 20X list.....$2.35 **3 for $5.95**
120 list ..... 1.75 **3 for 4.45**

PHOTOGRAPHIC ENLARGING PAPER

100 Sheet Packages — **Contrasts 1—2—3**

	SW	DW
4 x 5	$1.29	$1.59
5 x 7	1.59	2.09
8 x 10	3.45	4.00

VARIGAM

4 x 5 ..... $1.29

16mm SOUND PROJECTORS

Bell & Howell, Victor, Ampro

SPECIAL $159.00

AVAILABLE IN 8mm and 16mm

THE FOLLOWING FULL VERSION REELS

RELIGIOUS FILMS AVAILABLE

Life of Christ.....7 reels
Crown of Thorns.....8 reels
St. Anthony of Padua.....8 reels
Messenger of the Blessed Virgin....9 reels
Sound .....**$15.00 per reel**
8mm ..... **7.50 per reel**

HAL ROACH COMEDIES—
Snub Pollard & other famous stars, full version—available in 8mm approx. 200 ft. **$5.00** per reel—16mm **$10.00** silent per reel and **$12.50** sound. Approx. 400 ft.

ORIGINAL OUR GANG COMEDIES—
available in 8mm and 16mm **$5.00** for 8mm approx. 200 ft. **$10.00** per reel for 16mm silent approx. 400 ft. per reel—available in 1 and two reelers.

DEVELOPING SERVICE AVAILABLE

100' 16mm B&W.....$1.25
8mm 25' double B&W..... .60
8mm 25' double color..... 2.50
16mm 100' roll color..... 2.50
16mm 50' Mag. color..... 1.25
Above color prices refer to Ansco Color and Anscochrome only.

35mm FILM

Ansco Color Tungsten

100' $15.00
20 exp. roll..... 1.00
(3 for $2.75)

BULK FILM SPECIAL

- **Brand New Daylight Film Loader**
- **100' 35mm negative film**
- **12 empty 35mm cartridges**

Yours for only $5.95

*EXCLUSIVE—RADIANT

Portable Tripod Screens

With new VYNA-FLECT fabric. These screens are guaranteed for life—fireproof, fungus proof, and washable.

30 x 40.....$ 8.95
40 x 40..... 9.95
37 x 50..... 13.95
50 x 50..... 14.95

50" Screens are shipped R.R. Expr. collect postage

*YASHICA Reflex Cameras

Brand New—Latest Models—Just Arrived
Astra is proud to offer these highly prized imported cameras at sensational discount prices! CASE INCLUDED FREE!

	List	Price
YASHICA A	$35.95	$24.95
YASHICA C, semi-automatic	54.50	37.95
YASHICA LM, semi-automatic with built-in exposure meter	69.95	45.95
YASHICAMAT-AUTOMATIC	85.50	58.95

Brand New—Latest Model AIRES III L
with LVS shutter
35mm w/f1.9 lens & case
List Price—$109.50
ASTRA PRICE $75.95
Including Case

BRAND NEW—w/case SOLIGOR 66
SINGLE LENS 2¼ sq. Reflex
List Price—$109.50
ASTRA PRICE $69.50
150mm f:4 teleph lens—list $74.95—Now $54.50

B & W 35mm Film 100' Roll
PX, XX, BACK X, I.R., PLUS X....$1.25

FILM SPECIAL — FILM SPECIAL — FILM SPECIAL

Color or B&W

A $200.00 purchase will entitle you to a Kodak Brownie camera and projector for $1.00.
A $100.00 purchase will entitle you to a Kodak Brownie camera for $1.00.
A $50.00 purchase will entitle you to a Kodak Brownie flash camera for $1.00.
A $25.00 purchase will entitle you to a 127 camera and 10 rolls of 127 film free of extra cost.
This offer does not apply to purchases of Anscochrome film.

ACCESSORIES

CHEMICAL KITS—D88 .....$1.00
One gallon size good for reversal processing of paper and film.
Empty 16mm Magazines—3 for.....$2.00
16mm 100' camera spools and cans—3 pair for..... 1.00
35mm cartridges or cans—one dozen for 1.00
16mm 800' reels—3 for..... 2.00
16mm 1200' reels..... 1.00
Cans for above each..... .50
16mm 1600' reels..... 1.25
Cans for above each..... .50
8mm 400' reels—2 for..... 1.00
Double cans for above—3 for..... 1.00
Film cement, bottle..... .25

ANSCO COLOR FILM WITH PROCESSING

8mm 25' dbl. roll.....$2.25
8mm 100' on Bolex Spool..... 6.50
16mm 100' roll..... 5.00
16mm 100' roll sound..... 5.00
16mm 50' Magazine..... 3.50
SLIGHTLY OUTDATED

BLACK AND WHITE MOVIE FILM WITH PROCESSING

ASA 50

8mm 25' dbl. roll.....$1.15
8mm 100' on Bolex Spool..... 3.00
16mm 100' roll..... 2.50
16mm 100' sound ASA 24..... 2.50
16mm 50' Magazine..... 1.90
8mm 25' double ASA 200 High Speed Black and White with processing $1.75
With purchase of 5 rolls, 1 roll free.

USED CLEARANCE SALE

16mm Subjects Approx. 400' available in sound or silent.

For Home Use Only $4.95

16mm KODACHROME

100 ft. rolls—processing included. Slightly outdated. Developed by Eastman Kodak. Reg. $10.00. Price **$6.00** per roll.

SPECIAL ON NEW 8mm AND 16mm SUBJECTS

(Cartoons, Comedies and Westerns)

BLACK AND WHITE SUBJECTS

50' 8mm .....$ 1.00
200' 8mm 3.50
100' 16mm 2.00
400' 16mm (silent) 7.50
400' 16mm (sound) 10.00

ANSCOCHROME ASA 32

16mm with Processing

100' 16mm roll.....$8.00
50' 16mm Mag. 6.50

COLORCHROME

8mm Roll ASA 32.....$3.25
with Processing within Date

MOVIE FILM SPECIAL

ASA 50

4 25' double 8mm on camera spools .....$ 1.79
16 rolls as above..... 5.95
64 rolls as above..... 22.00
15 rolls 16mm 100' on camera spools 17.95
27 rolls as above..... 29.00
54 rolls as above..... 48.00
NO PROCESSING ON ABOVE

BULK MOVIE FILM ASA 50 NO PROCESSING

15 16mm 25' rolls.....$ 2.75
27 rolls as above..... 4.75
54 rolls as above..... 8.75
15 16mm 50' rolls..... 5.95
27 rolls as above..... 10.75
54 rolls as above..... 19.50
400' 8mm or 16mm..... 3.60

ROLL FILM

127, 120, 620, 116, 616, Black and White ASA 50—5 for.....$1.00
20X 35mm B&W ASA 50—4 for..... 1.00
36X 35mm B&W ASA 50—2 for..... 1.00

ANSCO COLOR IN BULK

16mm **4c** per ft.—Minimum order 50'
8mm 25' on camera spool.....$1.25
4—8mm 25' on camera spool..... 4.75

Daylight or Tung. No. 534 1955 Date

35mm x 100'.....$11.95
35mm x 50'..... 6.50
35mm x 27½'..... 4.00

Visit Our Store—Open Saturdays. Please Include Postage—$2.00 Deposit on All C.O.D.'s

ASTRA PHOTO PRODUCTS

243 WEST 55TH STREET
NEW YORK 19, N. Y.

AWON PHOTOGRAPHIC DISCOUNTS !!!

SAVE MONEY—Unless otherwise specified, all film and paper is government surplus, outdated, respooled and repacked to bring you bargain prices.

FRESH KODACHROME

This 1959 dated film is in its original sealed package. Day, or Tung. Price includes processing plus mounting of 35mm. **MINIMUM ORDER—3 ROLLS.**

Size	Kodachrome
8mm x 25' dble. roll.	$2.65
8mm x 25' dble. mag.	3.50
16mm x 50' mag.	5.25
16mm x 100' roll	7.75
35mm x 20 exp.	2.45
35mm x 36 exp.	3.80

Slide Tray SPECIAL

12 Viewlex or TDC slide trays (hold 36 slides each) $5.95
12 Airequipt slide trays (hold 36 slides each) $16.95

Special Sale! CASES

for 12 Slide Trays

Dust-proof protection for your color slides. Holds up to 12 2x2" TDC Viewlex or Airequipt Trays.. $4.95
CASE for 24 TRAYS $7.95

Black & White Movie Film Processing

8mm x 25' dble.	$ .55 ea.
16mm x 100'	1.00 ea.
16mm x 50'	.65 ea.

SALE—Brand New—Latest Models

MINOLTA Cameras

	LIST	AWON PRICE
35mm Minolta A w/case	$ 57.90	$40.50
Minolta A kit, case, fl	66.40	45.50
35mm Minolta A-2 w/case	78.90	$3.98
2¼ sq Autocord w/case	109.45	74.95
2¼ sq Minolta-L Autocord w/case	135.45	93.95

MOVIE FILM

Fast, fine grain B & W panchromatic ASA 50. Prices include new fast processing service.

8mm x 25' dble roll	$1.10
8mm x 100' Bolex dble	3.50
16mm x 50' mag	1.75
16mm x 100' XX ASA 100	2.95
16mm x 100' Kodak Plus X	2.95
16mm x 50' roll, Plus X	1.65
16mm x 50' mag. X or XX	2.25

BUY SIX ... GET ONE EXTRA FREE

Bulk Film Special

- BRAND NEW DAYLIGHT FILM LOADER
- 100' 35mm NEGATIVE FILM
- 5 FILM CARTRIDGES

All for only **$5.95**

ARGUS Sale!

BRAND NEW—DISCONTINUED

COMBINATION DISCOUNT!
ARGUS C-3 w/case, flash & reg. lens PLUS SOLIGAR 135mm f4.5 tele lens.
BOTH for only $64.95

	ORIG. LIST	AWON PRICE
Argus C-3 w/case & fl. (disc)	$ 66.95	$41.95
Argus C-4 w/case & fl.	99.50	66.95
Argus C-44 w/cs & fl.	117.00	79.95
SLIDE PROJECTORS		
Argus 300 BC	39.50	29.50
500 wt. aut chngr, case	79.50	58.95

16mm x 400' BULK KODAK

ASA 24—Single or Double Perf $6.95
Super XX ASA 100—Dble. Perf. 7.95

BARGAIN SPECIALS!

ENLARGING PAPER
9½ x 200" SWSM ±1, 3 ..... $4.25
10 x 10" Varigam SWSM (100 shts.) 2.95
CONTACT PAPER
10 x 10" SWSM ±4 ..... (250 shts.) $2.95

NEW EXPOSURE METERS

LIST		SPEC.
$ 9.95	—Alpex Direct Reading w/case	$ 5.95
	Sekonic Leader DeLux, Model 36, w/built-in booster cell and case	9.95
8.95	—Sekonic Leader DeLuxe, w/case	6.50
	Booster Cell for Sekonic Leader	2.95
9.95	—Compact, w/case	6.95
	DeJur SB Meter w/case ..... only	4.95
9.95	—FR Meter w/booster & cases	5.95
	—GE Pr-1 w Case (disc.)	18.95
9.95	—G.E. Mascot II w/case	6.95
32.50	—Weston Meter III w/case	22.45
	—GE Guardian w/case (disc.)	21.95
18.00	—Weston DR, Dir. Read. w/case	11.95

DARKROOM ACCESSORIES

BRAND NEW	List	Sale
Yankee Lordomat 20 Tank	$10.95	$ 7.28
Yankee 4x5 Agitank cut film	8.95	6.95
Yankee Safe (lite w 3 Filters	4.95	3.89
Airequipt Dialmaster Easel 11x17	17.06	12.89
Airequipt Jr. Printer 4x5	10.77	7.55
Brumberger 5x7 Adj. Metal Printer	22.00	14.95
Brumberger 8x10 Paper Safe	10.95	8.80
Premier A1 Roto Dryer 12x29"	27.50	18.92
Staticmaster 1" Brush	4.95	3.50
Spot-Matic Enlarging Meter	15.00	10.50
Morse G3 35.8 16mm Dev. Tank	34.00	25.95

NEW—SUPER HIGH SPEED—1959 DATE

ANSCOCHROME ASA 100+

35mm x 20 exp.—list $2.35—SALE 3 for $5.75
120 roll—list $1.75—AWON SALE 3 for $4.10
35mm x 100' roll $37.95
16mm x 100' roll $6.95

New! Ansco Super Hypan B&W Sheet Film—ASA 500

2¼x3¼ (box of 25 sheets) ..... 3 for $6.
4x5 (box of 25 sheets) ..... 3 for $9.

ANSCOCHROME 1959 ASA 32

35mm x 100' (orig. factory pack) $30.00
35mm x 28' (orig. factory pack) w/loader 7.69
35mm x 20 exp. reloads $1.35 ea. 4 for 4.98
120 or 620 ..... 3 for 3.00
16mm x 100' (no proc.) 5.95
16mm x 100' roll (incl. proc.) $8.50 ..... 3 for 24.00
16mm x 50' mag. (incl. proc.) $5.40 ..... 3 for 15.60

AWON Bulk Film Special!

35mm x 100' Kodak TRI-X	$3.50
35mm x 100' B&W ASA 24	.98
35mm x 100' Kodak Ortho Pos film	1.50
35mm x 100' Ansco ASA 50	1.50
16mm x 400' Positive Film	3.95
35mm x 100' Kodak Super XX	1.50

PAPER SALE

orig. boxes

CONTACT PAPER—less than 1¢ a print

4x5" SWGL (200 shts.) 3	1.00
8x10 AZO DW Luster ±3 (100 shts.)	3.50
10x10 SWSM ±4 (250 shts.)	1.95
10x10" SWSM ±1, 4—1 box (100 sts.)	.98
8x12" LWSM ±1, 2—1 box (50 shts.)	1.98
14x17" LWSM ±1, 2, 3—1 box (50 shts.)	1.25
11x14 LWSM ±2, 3, 4—1 box (50 shts.)	.98
8x10½" LWSM ±3—1 box (250 shts.)	1.50
7½x7½" SWGL ±4—1 box (250 shts.)	2.95
35mmx100' SWGL ±2 ..... $1.25 ea.; 3 for	2.95
10x20" SWSM ±3, 4 (50 sheets)	1.50
8x10" SWSM ±1, 3 (100 sheets)	1.95
10x10" DWAMS ±1 (100 sheets)	1.95
**10x10" SWGL ±1, 2, 4 ... 100 shts	$2.50
1,000 shts	22.50

ENLARGING PAPER

3½x5" DWSM ±2 (500 sheets)	3.95
10x10" SWSM ±1, 3 (100 sheets)	3.50
10x10" SWGL ±1 (100 shts.)	3.95
ANSCO COLOR PRINTON 8x10" (10 shts)	4.95
10x10" SWSM Variam (250 shts.)	6.95
9½x200' SWSM ±1, 3	4.45
9½" x1000' SWSGL Haloid Varaloid (variable contr)	8.95
11x14" DWGL ±1 (50 sheets)	9.95
8x10½" SWGL ±2 (100 shts.)	3.95
8x10½" DWSM ±1, 2, 3, 4 (100 shts.)	3.95
8x10½" DWSM ±1, 2, 3, 4 (250 shts.)	9.95
8x10 SWGL ±2 (100 shts.)	3.95
11x14 SWSM ±2, 3, 4 (50 shts.)	3.50
11x14 DWGL ±1, 2, 3, 4 (50 shts.)	3.95
11x14 SWGL ±3 (50 shts.)	3.95
11x14" DWSM ±1, 2, 3, 4 (50 shts.)	3.95
20x24" SWSM ±3 (50 shts.)	6.95
20x24" Velour blk DWSM ±4 (10 shts.)	3.50
4x5 SWGL ±1 ..... 200 sheets	$1.98
1,000 sheets	$6.95
9½" x 1000' SWSM ±1,2 $8.95 ea. ..... 2 for	$16.95

MOVIE—QUANTITY DISCOUNTS

B&W ASA 50. SIZE	Reversal. 54 Rolls	27 Rolls	No Processing 15 Rolls
16mm x 50'	$19.95	$10.95	$ 5.95
*16mm x 100'	46.95	28.50	15.95

*Camera Spooled.

NEVER BEFORE AT THESE DISCOUNTS!!

COMPLETELY AUTOMATIC 35mm SLIDE PROJECTOR

Just set the dial, and you can show your slides completely automatically with this special AWON combination—the new, electrically operated **AIREQUIPT ELECTRO-CHANGER** and the brilliant **MANSFIELD** "Midway" blower cooled aluminum projector. AWON saves you $26.95. Order now while the supply lasts.
Projector plus automatic Electro-Changer—list $75.90.

AWON SALE—$48.95

WOLLENSAK Sale!

All BRAND NEW! All in factory sealed cartons! Superb equipment and values at bargain prices.

MOVIE CAMERAS

	List	AWON PRICE
8mm Model ±42, f1.9 F.F.	$ 69.50	$ 50.75
8mm ±43, turret 3 lens f1.8	99.50	72.50
8mm ±58, f1.9 focusing	124.50	90.65
8mm ±53, 3 lens turret	199.50	145.00
8mm ±28 magazine, f1.9 foc.	139.50	104.65
8mm ±73 mag., 3 lens turret	239.50	174.80
16mm ±91 magazine, f1.9 foc	187.50	136.95
16mm ±93 mag, 3 lens turret	287.50	209.95

PROJECTORS

8mm ±715, 500 wt, 3 reels built-in splicer & case	162.50	118.65
8mm ±18, 750 wt, w/case	169.50	123.90
16mm ±65, 750 wt, w/case	199.50	145.00
2x2 Automatic SLIDE projector for 35mm and Superslides, 500 wt; ±815	149.50	108.75

TAPE RECORDER

±1500, dual speed, w/case .. 189.50 137.95

Brand New! Famous Make

ELECTRONIC FLASH

FAMOUS BRAND—Fair Traded so we can't advertise name, but you save $24.55

- Needs only 4 small batteries
- Hand-Grip head for "off-the-camera" shots
- Switches easily to AC power
- GE flash tube gives consistent exposure
- Comes with camera bracket and AC line cord

List price $54.50 **AWON SPECIAL $29.95**

ASA 50 Aero Ektachrome

35mm x 20 exp, $1.50 ea; 4 for $5; Process included.
35mm x 40' Bulk $3.95; 35mm x 75' Bulk $7.50
35mm x 75' Bulk plus 4½ gal. devel kit $8.95

ELECTRONIC FLASH OUTFITS

BRAND NEW	List	AWON PRICE
Ultrablitz Jet II, A.C. or Batt.	$69.95	$44.95
Hershey "700" A.C. and Batt.	54.95	34.95
RI DYNALITE A.C.	24.95	17.95
FR Model II, A.E. or Batt.	54.50	32.95
FR Model 140, A.C.	29.95	21.95
Ricohlite A.C. & Batt	49.95	34.95
Heiland 64A A.C. or Batt.	49.95	36.95
Heiland 64B A.C. or Batt.	59.95	43.95

And your old flashgun in trade

YASHICA Reflex Cameras

Brand New—Latest Models

	List	AWON PRICE
YASHICA A	$35.95	$23.25
YASHICA C, semi-automatic	54.50	35.95
YASHICA LM, semi-automatic with built-in exposure meter	69.95	44.95
YASHICAMAT-AUTOMATIC	85.50	58.25

YASHICA 44—127 film, 12 super slide exposures, 1/500, MX list w/case—$69.95 ..... AWON SPECIAL—$46.95
YASHICA 635—Dual reflex—2¼ sq. & 35mm built-in. Semi-auto. 1/500, f3.5. List w/case—$69.95 ..... AWON SPECIAL—$46.95

AWON CHOPS KODAK PRICES

ALL BRAND NEW—ALL LATEST MODELS

KODAK CAMERAS

	List	AWON PRICE
KODAK SIGNET 35mm outfit	$ 91.45	$ 63.49
KODAK SIGNET 35mm, f3.5 lens	75.00	48.98
KODAK RETINA IIIc 35mm, f2 w/case, disc model		94.95
KODAK STEREO outfit	99.50	74.60
KODAK STEREO camera	89.50	67.50
KODAK DUAFLEX IV	17.95	13.45
KODAK DUAFLEX IV outfit	25.25	18.95
BROWNIE HAWKEYE flash outfit	15.25	11.50
KODAK HOLIDAY flash outfit	9.95	7.10
KODAK PONY 135 model C, f3.5	36.50	27.00
KODAK PONY 135 model C, outfit	49.95	36.50
KODAK SIGNET 40, 35mm, w/flash	69.00	49.50

KODAK MOVIE CAMERAS

KODAK BROWNIE 8mm model II, f2.3	29.95	21.00
KODAK BROWNIE turret 8mm f1.9 (disc.)		59.95
KODAK MEDALLION 8mm mag. f1.9 (disc.)		79.95
KODAK MEDALLION 8mm mag. f1.9 foc	144.50	95.80
KODAK K100 16mm f1.9 lens	229.00	223.75
KODAK K100 turret 16mm f1.9 lens	337.00	251.75

KODAK PROJECTORS

CINE KODAK Showtime 8mm proj	123.50	84.95
CINE KODAK Showtime w/variable speed control	139.00	96.95
BROWNIE "300" 8mm movie proj	64.95	46.95
BROWNIE "500" 8mm movie proj	79.50	57.95
KODASCOPE ROYAL 16mm movie proj	295.00	220.75
KODAK "300" 35mm slide projector w/readymatic changer	64.50	45.95
KODAK "300" w Airequipt chngr	74.50	52.95
SIGNET 500 wt 35mm proj, auto chngr	82.50	59.95

Ask for the AWON DISCOUNT PRICES on all equipment

35mm BULK NEGATIVE SAFETY

Kodak Plus X, SUP, XX, Kodak Weston 24 Infra Red Microfile, Ansco ASA 50 or DuPont ±1, 2, 3
100' $1.98 ea., 400' $7.50
FREE, 100' of ASA 24 w/every 100' Order!
35mm x 20 Exp. Cartridge Plus X, Sup XX, Tri-X, Infra Red, Microfile 6 for $1.50; 12 for $2.50

CUT FILM SPECIALS

4x5 Kodak Infra Red (100 sh.)	1.00
4x5 Ansco Proc (25 shts)	3 for $3.50
8x10 E.K. Contr Proc Pan or Ansco Process (25 sh)	1.98
	6 for 8.95
8x10 EK Infra Red (100 shts)	3.95
8x10 Ansco Repolith thin bas (24 sh)	2.95
10x12 E.K. Com'l. (10 sh.)	1.98
11x14 Contr Proc Pan (10 sh.)	1.98

COLOR CUT FILM SPECIALS

4x5 Ektacolor Type 8 (10 sh.)	$1.95
5x7 Ektachrome (10 sh.)	2.95
8x10 Ektachrome (10 sh.) ea.	3.95
	3 for 10.00
4x5 Ansco Color (Tung) 10 sh.	ea. $1.50; 6 for 6.00

KODACHROME PROCESSING

35mm x 20 exp. mtg.	$1.00
35mm x 36 exp. mtg.	2.00
8mm x 25' dble.	1.00
8mm x 25' mag.	.65
16mm x 50' mag.	1.00
16mm x 100' roll	2.30

All film returned via insured mail. Check or Money Order must accompany film.

FLASHBULBS Sale!

Genuine WESTINGHOUSE BULBS. Frankly, we're overstocked. We've slashed our prices to encourage you to buy a case or more and save.

±5 (Case of 120)	$ 8.95
M2 (Case of 120)	7.95
SM (Case of 120)	11.95
5B (Case of 120)	12.95
±6 (Case of 120)	12.50
6B (Case of 120)	14.95

EXCLUSIVE—RADIANT

Portable Tripod Screens

With new VYNA-FLECT fabric. These screens are fireproof, fungus proof, and washable.

30 x 40	$ 8.95
40 x 40	9.95
37 x 50	13.95
50 x 50	14.95

50" Screens are shipped R.R. Expr. collect postage

Bulk ANSCO COLOR

Daylight or Tung. ±534 1955 Date

35mm x 100'	$11.95
35mm x 50'	6.50
35mm x 27½'	4.00

4-LITE Folding MOVIE BAR LIGHT

With metal carry case, 2 toggle switches & 7' heavy duty cord.

AWON SALE $7.50

Bulbs remain on bar in case $1 ea. with purch. of bar.

THIS MONTH'S SPECIALS

- 70mm x 100 Super XX $ 2.95
- 120 & 620 Kodacolor 3 for 3.75
- Telephoto Lens, 8mm, 1½", f3.5 4.95
- Wide angle lens, 7mm, f/3.2, F.F 11.95
- Cardboard Stereo Mounts. 100 for 3.50; 1000 for 26.50
- Ansco 35mm Cardboard Mounts, 100 1.00; 1000 for 8.50
- Daylight Bulk Film Loaden & 5 cartridges 4.95
- ANSCO 120 All Weather Pan 12 for 3.50
- KODACHROME 828 (proc. incl.) 3 for 3.00

SEND 25¢ for complete CATALOG listing all equipment at unbeatable prices!

Include 20% deposit on all C.O.D. orders. All equipment is NEW, all film & paper outdated and sold as is, all outdated film is respooled from bulk, unless otherwise stated. All footage approximate.

Export inquiries invited!

Postage & Insurance must be included with order. Excess refunded. All prices subject to change without notice.

SPECIAL AWON COMBINATION DISCOUNT! ALL BRAND NEW!

AIRES III L

35mm camera with 6 element f1.9 lens.

plus CASE and B.C. FLASH GUN
plus Photoelectric EXPOSURE METER —all for only
plus Microlite 35mm VIEWER **$89.95**
plus Genuine Leather GADGET BAG

AIRES III L Camera and case alone—limited supply. Order Now! **$75.95**

AWON FILMS

108-P W. 29 St.
N. Y. 1, N. Y.
LA 4-6376

GENTLEMEN: Please send me immediately the items listed below. I enclose $..... including postage and insurance costs (excess refunded).

NAME

ADDRESS

CITY ZONE STATE

COLOR PRINT SPECIAL

YOUR CHOICE

3½ x 5
* 25¢ each
(from 35mm)
* ANY 12
2.99

3½ x 3½
* 20¢ each
(from 2¼ x 2¼)
* ANY 14
2.99

2½ x 3½
* 15¢ each
(from 35mm)
* ANY 20
2.99

*MINIMUM ORDER 2.99

Try PANORAM FOR ALL YOUR FILM NEEDS . . .
"YOU'LL BE SO GLAD THAT YOU DID"

STILL AND MOVIE COLOR FILM PRICE LIST
FACTORY FRESH RELOADS

FILM TYPE	SIZE	3 ROLLS	10 ROLLS
KODACHROME ANSCOCHROME EKTACHROME	135-20 exp.	3.95	12.50
	135-36 exp.	5.35	17.50
KODACHROME	STEREO 15 PAIR	3.95	12.50
KODACHROME	STEREO 28 PAIR	5.35	17.50
KODACHROME	8mm ROLL 25' Double	5.25	16.50
KODACHROME	16mm ROLL 100'	15.75	51.00

KODACHROME, ANSCOCHROME, EKTACHROME
PROCESSING

35mm (20 exp.) and 828 including mounting . . . . . per roll
8mm 25' roll . .
1.00

35mm, 36 exp. including mounting..$1.75
STEREO: 35mm, 15 Stereo pairs including mounting 1.75
28 Stereo pairs, including mounting 2.75
8mm 25' magazine..... .75
16mm 50' magazine..... 1.00
50' roll.....1.50 100' roll.....2.50

35mm COLOR SLIDE DUPLICATING
15¢ each mounted
20 for 2.99

4 x 5
4x 50¢ ea.

5 x 7
5x 85¢ ea.

8 x 10
8x 1.75 ea.

PANORAM FILM LABS INC., 1190 SIXTH AVE., N. Y. 36

CLASSIFIED ADVERTISING

NOTICE: Rates 75¢ per word. Minimum 10 words. August issue closes June 17th. Send order and remittance to Popular PHOTOGRAPHY, 1 Park Ave., N. Y. City 16.

CAMERAS AND EQUIPMENT TO SELL

CANADIANS. Write to-day for bargain list on new and used equipment. Kirshner's Camera Supplies, 77 Craig St. West, Montreal 1, Que.

CHICAGO'S Largest Camera Trading Center! Open evenings! Better deals! New-Used! Mailorder satisfaction! Chromoptics, 943 North State, Chicago 10.

LARGEST Camera discount house in the East. Write in your needs Dept. PP, "King For Price", Box 398, Springvalley, N. Y.

CANADIANS send for bargain list, new and used equipment. Simon's Camera Inc., 11 Craig West, Montreal, Canada.

DISCOUNTS to 50% on cameras, projectors, tapes, recorders, Hi-Fi components. Request specific prices. Long Island Camera Exchange, 3 Bay 26th Street, Brooklyn 14-M, N. Y.

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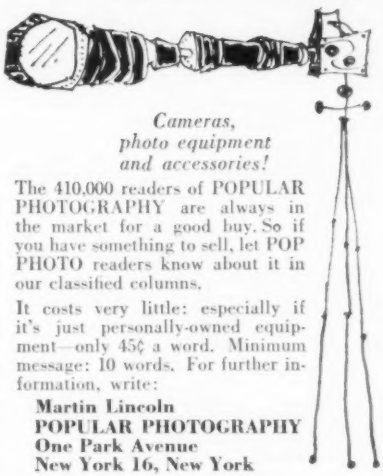

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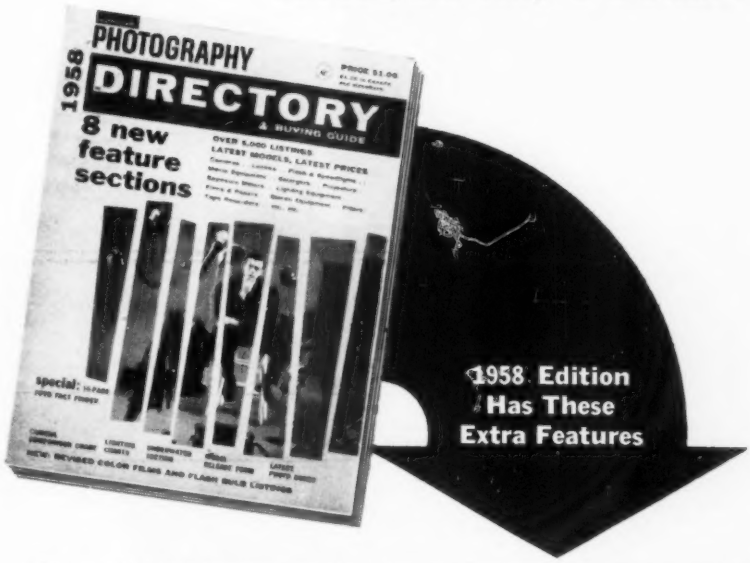

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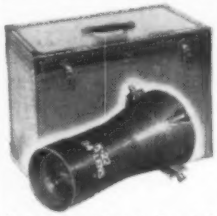

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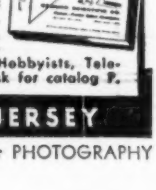

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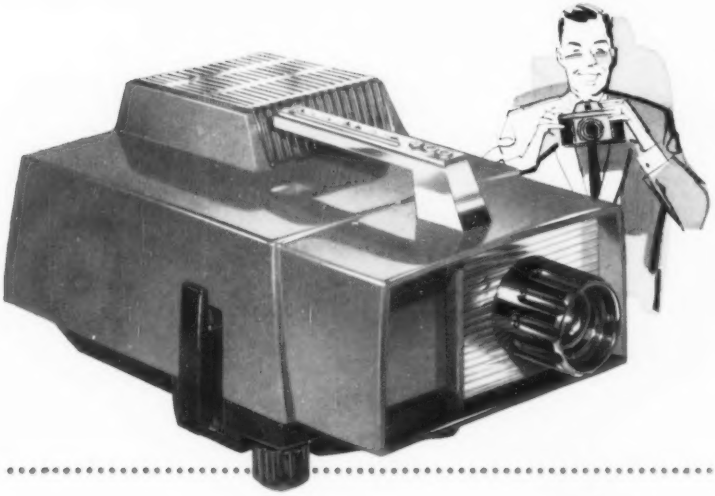

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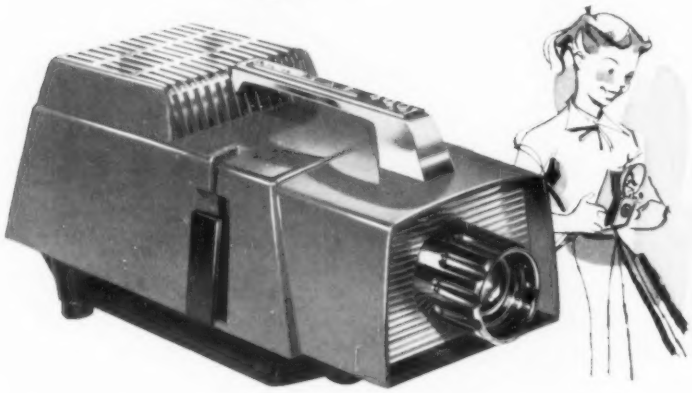

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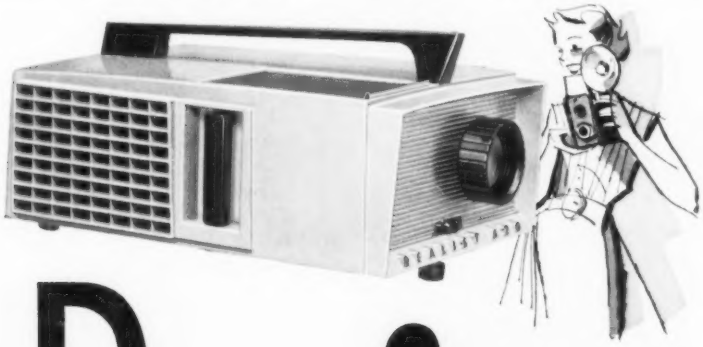

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